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

Habenaria viridiflora, the Frog Orchis, has a very short 2-lobed spur, linear flat 3-pointed lip, the middle point the shortest. The flower is green, and the lip of a brownish colour. It is the Peristylus Lindley, and the Himantoglossum of Reichenbach. In this it is in point.

H. bifida, 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 healthy places.

H. chlorocephala, 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 Babington, 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, Gun, 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 upon 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 co-operated with him in historical and other studies. William Babington 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 he untrue or involve nothing discreditable. He died at Hindlip on the 18th of November, 1664, when he had but just completed his fortieth year. His published writings were the following:—1, 'Castars,' a collection of poems, first printed together in 1635, and again more fully and correctly in 1640. 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.

H. Sudbury, 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 Swuir, the director of the Berlin Academy, and of Sulzer. In 1765 he visited Paris, and in 1768 he 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. Philipps's first works of importance however were the six large pictures of the Russian
naval victory of Tychæsme, 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 2500 rubles, in 1771, or 1600 florins, at Venice, to Count Orlov, to whom the works were sent at Leghorn, was upon the whole highly gratified by their successful accomplishment, has given the painter the representation of the execution 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 the fleet, and 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, he exhibited in the year 1772, at Venice, and the spirit of his productions, as also the name of the artist, is evident in the whole of his recent productions. As, for which supposition however we find no plausible ground, but he adds, 'unless you would rather have it from the French Hackney,' which is a word of similar meaning. Many emigrants to Hackney, and Hackney-carriage, in the 20th 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 in Rome. In the meanwhile two other brothers, Wilhelm and Karl, joined Philipp in Rome, but William went shortly afterwards to St. Petersberg, and died there in 1780, aged only thirty-two, and Karl settled in Sitterted. Philipp accordingly in 1778 sent 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, though praised by Wilson, who was not particularly acquainted with him at that time: Wilson left Rome in 1755. In 1777 Hackert made a tour in Sicily with Richard Payne Knight and Charles Gore, and then he returned 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 Rasumovsky. The king took great pleasure in the works of Hackert, and treated him with great kindness and familiarity; he used to style him Don Filippo. In 1785, after the departure of Count Rasumovsky, he appointed Hackert his principal painter, who settled with his brother from that time in Naples. They had apartments in the Palazzo Francavilla on the Chiaia, which they occupied until they were dispossessed by General Rey, the French commander-in-chief of Naples in 1799, who took possession of themselves and his house; 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. Hackert's salary was for a certain number, with his apartments free, both in Naples and at Caserta. In 1787 Hackert painted a large picture of the Launch of the Parthenope, 64, the first ship of war which was built in Naples, in 1785. It was engraved by his brother George, and was painted five other large pictures of Neapolitan scenes, which were all exhibited by some historical scene of interest: they are in the palace at Caserta. In 1788 the king sent Hackert to the East Indies, and the seaports of that coast, which he painted, from Manfredonia to Taranto. In 1790 he visited on a similar mission the coasts of Calabria and Sicily; the king equipped for him a small felucca called a swagetti, manned with twelve men well armed, for the express purpose; he was out about five months, from April to August inclusive.

Hackert lived, after his departure from Naples in 1799, about one year in London, where 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 often lacking, and in these paintings of Italian landscapes of any particular scene 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 something more minute, in which case there is a magnificent manner of his characterises 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 encaustic, and in body wash, and engraved in mezzotinto, scappavia, a species of stippler. He also etched several plates.

Goethe has written a eulogist Life of Hackert, whose close imitation of nature delighted the German critic, and he has extolled him beyond his merits; while he compares Flaxman with Salatteli, and damnus his noble designs with the faint praise that they have some pretty ideas in them; he considers the Englishmen as the writers of the beginning of the 18th century.

(Goethe, Werke—Philip Hackert; and Winkelmann und sein Jahrhundert.)

HACKNEY-COACH. The derivation of the word Hackney,应用的class of public conveyances, has occasioned much speculation. Bailey, in his Dictionary, adoptes what appears to have become a popular notion, that the name is derived from the hackney, or small saddle of London; for which supposition however we find no plausible ground, but he adds, 'unless you would rather have it from the French Hackney,' which is a word of similar meaning.

Hackney-carriages, or Hackney-coaches, to the English nation, are a representation of the Latin equus, a horse, thus:—equus, ahus, ahuus, ahus, ahuus, hackney. Another conjecture derives it from an Anglo-Saxon word meaning to neigh, on the supposition that a lively horse, given to neighing, and which is the most likely in the hackney-carriages and Stage-carriages is further implied, rather than distinctly expressed, by the provision that nothing in the act shall extend or apply to any stage-coach used for 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, being usually, though not invariably, dependent upon distance.

As far as can be gathered from such notices as the writer has met with, this class of public vehicles appears to have been originated in Scotland. In London, however, they have been much more in use, and in particular the hackney-coaches. London may be perhaps distinctly traced from notices in Macpherson's 'Annals of Commerce,' and in Anderson's 'History of Commerce,' of which work the early volumes of Macpherson, are reprinted with but few alterations. Under the year 1625 Macpherson, or rather Anderson, observes that 'our historiographers of the city of London relate that it was in this year that hackney-coaches first began to ply in London under the name of hackney-coach.' Under the year 1784 sedan-chairs appear, for the first time, to have entered into competition with hackney-coaches, the sole privilege being granted in that year to Mr. Sanders Duncombe to 'use, let, and hire' a number of 'covered chairs,' such as he represented to be in use in many places beyond sea, for a period of fourteen years. The objection was raised, that the inconvenience occasioned in the streets of the metropolis by the unnecessary multitude of coaches. In the following year an attempt was made to check the increasing use of the above accommodations by the prohibition of 'immense use of coaches' by a proclamation from the king (Charles I.) that no hackney or hired coach should be used in London, Westminster, or the suburbs, unless it was engaged to travel not more than four miles out of the same; and that each coach owner should constantly maintain four able horses for the royal service when required. Finding it impossible to prevent the use of so great a convenience, a commission war
issued to the master of the horse in 1837 to grant licences to fifty hackney-coaches in and about London and Westminster, and as many others as might be needful in other places in England, but in no place more than twelve horses. In 1852 the number of hackney-coaches daily plying in the streets was limited to 200; in 1864 it was increased to 300, allowing however only 600 horses; in 1861 to 400; and in 1864 to 700. On an act of the 9th 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-chairs were also licensed. The number of chairs was shortly increased to 300 by the act 12 Geo. 1. c. 12 to 400. In 1771 the number of coaches was further increased to 1000.

Notwithstanding this steady increase in the use of hackney-coaches, they were long regarded 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. 27, &c., from which it appears, by a quotation from a letter of Garrard, that completely lost sight of stand was established in 1834, by one Captain Bally, 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; not 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 indifference to the interests of their customers. In 1823, only a few years to the year 1823, while that monopoly was undisturbed, hackney-coachmen appeared to have sunk lower and lower in the scale of efficiency. 'For some two hundred years,' observes Mr. Routh, in his 'History of the Stage,' 'the hackney-coach was the best vehicle in Europe for travelling, riding, the casualties more sedentary, the carriage through all its phases of dirt and discomfort; the springs growing weaker, the 'iron ladder' by which we ascended into its bony cavities, in its rattling galda, the cushions more redolent of distant 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 everyday use. In the year 1813, 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 found impossible to get licences for them. We feel the difficulty Moses, Bruck, and Rochet (the latter a member of parliament) obtained licences for eight cabriolets in 1828, and started them at fares one-third lower than those of hackney-coaches. The new vehicles were only by one horse only, and carrying only one passenger besides the driver, who sat in the cabriolet (or, as more commonly called for brevity, the cab), with his face. An improved build was soon introduced, by which the cabriolet was divided, so that 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 almost 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, for four persons. 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 cabs, 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 cabs 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-carriages licensed for use during the year ending January 4, 1845, was 2450, all of which, with the exception of less than 200, were cabs, or cabriolets. In the year ending May 1844, was 4927, besides 371 'watermen,' or 'attendants upon the 130 regular metropolitan coach-

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 carriage in the hands of the registrar of licences to whom the owners of the lost property may apply for its restoration, upon paying for the driver's time and trouble; and, incredible as it may appear, the estimated value of the property thus taken to the office in the first four years and a half after the introduction of this rule is estimated at 35,000l., while very few applications were made for property which was not thus restored. Of late years however the case has been very different, for while from 50 to 100 cases, or lost articles, have been taken to the office in twelve months, they are all of small value; and the applications made for lost property are at least fourteen times that number. To lessen the risk in reference to one very important part of the employment of hackney carriage business, the great railway companies which have terminated in London enter into arrangements by which a limited number of carriages, driven only by men of well attested respectability, are allowed to stand within their stations, to convey passengers arriving by the trains to their respective destinations, under a system of supervision so strict, that any case of misconduct or overcharge is almost certain to be brought home to the guilty party; and it is gratifying to know that this measure has proved productive of the best results in promoting honesty and civility among a class of men, which has been hitherto affected by the strictness of the licensing system, and by the various efforts made, especially by the agents of the London City Mission, for their education and religious welfare.

It is thought that in this class of vehicles the freedom of drivers leads to the (we believe universal) adoption of a system of remuneration which is not calculated to promote honesty and good feeling. It appears, the writer of the paper we have quoted above, 'that the drivers have no chance of being honestly dealt with, if they were to pay wages to their servants.' They therefore, 'adds, 'load the vehicles and horses at a fixed sum per day; and further, the men are expected to bring home the stipulated amount. Sometimes, in the dull season, they beg off for less, but it was remarked to us by the manager of the largest establishment of cabs in London, 'that in the dull season ever so prosperous, they never produce more than the stipulated amount, to make up for former deficiencies.' The experiment of paying liberal wages, and trusting to the honour of the men, is said to have been tried and found utterly impracticable. 'The average produce of each hackney-carriage to the proprietor,' according to our authority, 'may be about ten shillings and sixpence a day, to which, if about three-and-sixpence be added for cash and fares taken, the appropriation by the drivers in lieu of wages, the amount (of earnings or receipts) per diem is raised to fourteen shillings.' 'Hence,' he adds, 'we may conclude that there is spent daily by the London public for coach and cab hire 1712s., and yearly almost 800,000l.' Hackney-coaches were, according to Beckmann ('History of Inventions,' English edition of 1814, vol. i. p. 184), first established in Edinburgh, in 1738. According to a patent (p. 131) it appears they were first used at Paris in 1850, although, if this date be correct, he is wrong in stating that the use of hackney-coaches originated there. He attributes their introduction to Nicholas Savaugue, from whose residence, the Hotel S. Fiacre, such carriages took their common French name of fiacres. About 1869 a small kind of hackney carriage, resembling a sedan-chair on wheels, called a brouette or rouette, or sometimes, by way of derision, a viniogrette, and drawn by men, was brought into use. Cabriolets, as above stated, appear to have originated in Paris.

For an abstract of the law relating to hackney and stage carriages, duties, licences, &c., see METROPOLITAN STAGE CARRIAGE. P. C. S. HADRAMAUTE. [ARBIAH, P. C. S. AND P. C. S.] HEMANTHUS. [AMANTHUS, P. C. S.] HEMATOCoccus (from alga, blood, and sodes, a grain), a genus of plants belonging to the natural order of Algae. It is characterised by being composed of either being oval or spherical, cells, in one or more concentric vessels, or membranes, multiplied either by division or by granulae formed within the parent cells. Several of the species of this genus are terrestrial. One of the first observed was the H. saugnutus, which, like the red-snow plant ('Protococcus nitida'), has its cells coloured red; hence the generic name. Several of the species however
HAGUE, ALLIANCE OF THE. As the general war which was terminated by the Peace of Paris in 1697 [T.C.X, 297] was preceded by what is called the First Grand Alliance, formed 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 concluded 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 result of his personal 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., xv, 292.]

HAGUE, LAURENCE. 17th century, a Protestant minister, was educated at the University of Marburg. In 1678 he removed to Sweden, where he became a sort of spiritual father to the King, and lived to the end of his reign. He was kind and benevolent to the Swedes, and it is related that at times he kept open house for the poor. He never married. His writings are numerous, and were mostly anti-Catholic. He died at Stockholm in 1720. His writings are numerous, and were mostly anti-Catholic. He died at Stockholm in 1720. He died at Stockholm in 1720.

HAGUES. Town in France, administratively a commune in the department of Doubs, district of Besançon, arrondissement of Besançon, canton of Corbigny. It is located in the Morvan massif, at an altitude of 300 m, 12 km northeast of Besançon. It is a wine-producing area, producing white wines and a local hard cheese. It is also known for its black truffles. The town has a population of approximately 13,000.

HAGUES, Martin. 18th century, a French physician, was born at Huy in Hainaut, and studied at Louvain. He later moved to Paris, where he became a doctor in 1744. He is known for his work on the treatment of scurvy and other vitamin deficiencies. He died in Paris in 1791.
out his great work, the 'Organon of the Healing Art,' in which he developed his western system to the exclusion of 'Homoopathy,' by which it has since been distinguished. [HOMOPATHY, F. C. S.] In 1811 the first part of the 'Materia Medica Pura' was published, and still it lists the names of the 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 prescriptions, they eventually, after some litigation, forbade him in 1828, to retire for practice, when the Duke of Anhalt Cöthen offered him an asylum in his dominions, with the enjoyment of those privileges of which he had been deprived at Leipzig. He was again his sojourning at Cöthen, in the year 1829, that he published in four volumes his work on 'Chronic Diseases, their Peculiar Nature, and Homoepathic Cure.' In the year 1829 the disciples and adherents of Hahnemann were struck with the idea of marking 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 Minnea P. x April et Annis. Erlangeri x Augusti MDCCCLXXII.' On the reverse, in the centre, 'Similia Similibus; the inscription, 'Medicinae Homoepathicae Auctori, Discipuli, et Amici, P. x Augusti MDCCCLXXXII.' His adherents had at this period greatly increased, and he enjoyed a very extensive practice among his own countrymen and foreigners.

Having been a widower for some years, he married in 1835 a French lady, Mme. de Herville, who had visited Cöthen for the benefit of his advice, and at her desire he removed to Paris. In commemoration of his arrival 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 'Similia Similibus curatur,' engrafted by a snake; the inscription, 'Les Homœopathes de France à leur Maître.' N° 6 à Meisen le 10 Avril, 1752, venus en France le 25 Juin, 1835.' He remained at Paris in the active exercise of his profession, and surrounded by numerous followers, till the day of his decease, which took place on the 2nd July, 1843, in the eighty-ninth year of his age.

Hail. [Snow, F. C., p. 165, col. 2] [Snow, F. C., p. 166.] 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 agency can forestall or prevent them, it is utterly impossible to produce them by fraud, appear to render such casualties peculiarly fit, so soon as observation and experience shall have established accurately the average risk, for the consideration 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 imposture. Several 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 in which the details are given, many farms of considerable extent were completely destroyed by hail-storms in Hertfordshire, Middlesex, and Essex; the damage done upon a space of 3487 acres in the last-mentioned county alone was estimated at $14,574, or about 42. 3s. 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 of the months of July and August, 1843, by which immense damage was done in Cambridgeshire, Norfolk, Suffolk, Essex, Hertfordshire, Berkshire, Kent, Oxford, Dorset, Gloucestershire, and Yorkshire, several cases of individual loss amounted to upwards of 2000L. The breaking of glass in windows and skylights, and more especially in conservatories and hothouses, is one of the most frequent incidents inflicted by hail-storms; the masses of ice which fall being 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,' hail-stones having a diameter of two inches, a size which has been exceeded in several well-authenticated cases, will fall with a velocity of 1184 feet in a second, or more than 14 miles in a minute. On the 19th of May, 1806, it is estimated that 20,000 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 stripped. An ice-lash of pans is supposed to have been broken in the northern suburbs of the metropolis on the 30th of July, 1826. Hail-storms of from six to eight or nine inches in circumference are frequently mentioned in the periodical literature of that year, and this list referred to, which are compiled from contemporary publications; and on the 3rd of August, 1824, when the eastern part of Suffolk was visited by violent hail-storm, by which bowls and game, as well as glass and crested pigeons, 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 about the same time are alluded to as one, which would render this proportion yet more remarkable, the cases recorded in the above-mentioned lists occurred as follows. We have, of course, taken care to omit those storms of which two separate accounts are given in the month of January. February 1. March 3. April 4. May 7. June 10. July 17. August 19. September 27. October 0. November 0. December 0.

In the article 'Hail,' in Brande's 'Dictionary of Literature, Science, and Art,' are some curious facts collected from various authorities, 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 large cabbages. An ice-lash of pans is pieces rather than balls of ice. 'Hail,' according to this authority, 'usually precedes storms of rain, sometimes accompanies, but never or very rarely follows them, especially if the rain is of any duration, and the cessation of its continuance is always very short, generally only a few minutes, and very seldom more than a quarter of an hour.' The writer of the article referred to further remarks, that 'the close from which hail is precipitated appears to be of very considerable extent and depth, inasmuch as they produce a great obscurity. It has been remarked,' he adds, 'that they have a peculiar grey or reddish colour, and their lower surfaces present numerous protuberances, while their edges exhibit deep and numerous indentations.' Hail is said to be always accompanied with electrical phenomena, and it is generally believed that such are the cause of its formation. The numerous list 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 'Farmer's Almanac' for 1845.
HAINES is the name given to a river lately discovered in the eastern parts of Africa, in those countries which are comprehended on our maps under the name of Zanguebar. The eastern coast of Africa, from the equator northward to 6° or 7° S. latitude, consists of deserts, sand-hills, and a complicated wilderness; its aspect from the sea is very promising, the coast south of Magadoxo presenting only an uninterrupted series of sand-hills, whilst that north of Magadoxo is formed by immense sand-hills and deserts. But Lieutenant Christopher, in 1843, discovered, that at the back of the sand-hills there is a considerable river, which waters an extensive valley, filled with alluvial soil and exhibiting a great degree of fertility: this river, whichprobably originates in the high countries which surround the most southern affluents of the Abal, or eastern branch of the Nile; but as the intervening countries have never been visited by Europeans, we are unable to determine whether any of the rivers rise in these countries and which of them sends its waters to the Haines. Lieutenant Christopher was informed that north of 4° S. latitude the river is already considerable. He visited it at Girédi, a town situated twenty-two miles north-west of Magadoxo, inhabited by more than 7000 individuals, and surrounded by extensive fields, on which Indian corn and millet yield such abundant crops that large quantities of them are sold for exportation and consumed by the natives. The river here is about 200 feet wide, and too deep to be forded in the dry season. From this place the Haines runs nearly parallel to the coast for ten or twelve miles; it then bends eastward for four miles, and numerous villages are found on its banks, surrounded by extensive fields irrigated from the river. The volume of water carried away decreases considerably by this irrigation; but at the most southern point where it was seen by Lieutenant Christopher, which was due north of the town of Brava, where it was only from 70 to 150 feet broad, but from 10 to 15 feet deep. From this place the river continues in a south-western direction, and terminates, according to the statement of the natives, in an extensive lake said to be inestimable. This lake is about sixty miles from the eastern banks of the river Jubb or Gavindo, and perhaps not so much as a mile from the coast. The alluvial soil of the broad alluvial tract traversed by the Haines River are a mixture of Somauss, Galla, and negroes, among which a small number of Arabs are settled. It appears that the greater part of them are Mohammedans. The chiefs of the country are Somauss, but their power is limited, as it appears, by a kind of aristocracy.


HAL. (Halle, P. C. S.)

HALE'SIA (named in honour of Stephen Hales, D.D., author of 'Vegetable Statics,' Sec.), a genus of plants belonging to the family of the Compositae, to which belong the corolla ventricosum campanulata, with a 4-lobe erect border; the stamens 12 to 16; filaments combined into a tube at the base, and adnate to the corolla; the anther oblong, erect, 2-celled. It is: a herb or a shrub; the flowers single; the fruit a drupe, which is dry, oblong, with 2-4 winged angles, terminated by the permanent style; the seeds 1-seeded, with the seeds at the bottom of the cells. The species are trees with alternate serrated leaves, and lateral fascicles of pedicellate drooping white flowers. This genus has been made the type of an order Haleasieae by D. Don, who is followed by Link and others.

H. heteropetala, common Snow-drop tree, has ovate, lanceolate, acuminate, sharply serrated leaves; the fruit with four wings. This plant is a tree, growing from 15 to 20 feet high, and is native of South Carolina. It has fine white flowers from 9 to 10 in a fascicle, drooping and resembling those of a snowdrop. The wood is hard and veined. It is one of the hardest and also one of the handsomest of the American deciduous trees. The rate of growth for the first five or six years is from 12 to 18 inches a-year. It ripens its seeds freely in this country, and it may be propagated from these or imported seeds. There is another species, H. diploa, which is a native of South Carolina, but does not attain so great a height as the last, and has much larger flowers. H. porrecta is a native of Florida, and is supposed by some botanists to be merely a small flowered variety of the first. They will grow in any good soil, and may be propagated by slips from the root, as well as from seeds.

(Don, Gardner's Dictionary; London, Encyclopedia of Trees and Shrubs."

HALFORD, SIR HENRY, was born on the 20th of October, 1766, and was the son of Dr. James Vaughan, physician to the Infirmary at Leicester, and author of 'Observations on Hydrophobia, on the Case of Cantharides in Paralytic Affections.' Sir Henry received his education at Eton, and was afterwards admitted at Christ Church, Oxford; he graduated in Medicine at Cambridge in 1794, and was elected a fellow of the College of Physicians in the same year. Having been well introduced into the practice of his profession, but Lieutenant Christopher, in 1843, discovered, that at the back of the sand-hills there is a considerable river, which waters an extensive valley, filled with alluvial soil and exhibiting a great degree of fertility: this river, which probably originates in the high countries which surround the most southern affluents of the Abal, or eastern branch of the Nile; but as the intervening countries have never been visited by Europeans, we are unable to determine whether any of the rivers rise in these countries and which of them sends its waters to the Haines. Lieutenant Christopher was informed that north of 4° S. latitude the river is already considerable. He visited it at Girédi, a town situated twenty-two miles north-west of Magadoxo, inhabited by more than 7000 individuals, and surrounded by extensive fields, on which Indian corn and millet yield such abundant crops that large quantities of them are sold for exportation and consumed by the natives. The river here is about 200 feet wide, and too deep to be forded in the dry season. From this place the Haines runs nearly parallel to the coast for ten or twelve miles; it then bends eastward for four miles, and numerous villages are found on its banks, surrounded by extensive fields irrigated from the river. The volume of water carried away decreases considerably by this irrigation; but at the most southern point where it was seen by Lieutenant Christopher, which was due north of the town of Brava, where it was only from 70 to 150 feet broad, but from 10 to 15 feet deep. From this place the river continues in a south-western direction, and terminates, according to the statement of the natives, in an extensive lake said to be inestimable. This lake is about sixty miles from the eastern banks of the river Jubb or Gavindo, and perhaps not so much as a mile from the coast. The alluvial soil of the broad alluvial tract traversed by the Haines River are a mixture of Somauss, Galla, and negroes, among which a small number of Arabs are settled. It appears that the greater part of them are Mohammedans. The chiefs of the country are Somauss, but their power is limited, as it appears, by a kind of aristocracy.


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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 portions of the 'Odes of Horace.' Lord Swithinbury or Lord Swithin 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 is preserved in the 'Supplement to the Works of Prior,' 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 his career of administration. Just before, in his 'Lives 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 office, and he, therefore, supposes 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 Malton; and he was returned for the same place to the next parliament, which met in March, 1689. It is stated to have been about the time of the Revolution that he married the Countess Dowager of Manchester: 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 Whig party to make him a member of the council of ten, in his purpose he purchased for 1600l. the place of one of the clerks of the council. He was also fortunate in his next poetical performance, 'An Epistle to Charles, Earl of Dorset, occasioned by his recent victory, the deliverance of the battle of the Boyne,' for which Klug William, to whom he was introduced upon the occasion by Dorset, is said to have bestowed upon him a pension of 500l. A report of his majesty's, who was then in the Dilapidation of his fortune, as a mouse is said to have replied that he would make a man of him, is upon good grounds accredited by Johnson. His Epistle on the Victory of the Boyne, which extends to above two hundred lines, is Montagu's greatest effort in verse.

The rest of his history is that of a political character, and only a patron of poets. Johnson relates a well known anecdote of him: in 1697, in the midst of which he is said to have fallen into confusion, and then, when he recovered himself, to have ingeniously turned the circumstance into an argument for what he was urging, the allowance of counsel to the prisoner. There is no notice of this speech in the Parliamentary History. He had already, however, raised himself by his speaking to great distinction; and on the 21st of March in this year he was taken into office as one of the lords of the Treasury. Burnet first notices him as making a great figure in the House under date of the year 1693. 'He had,' he says, 'great vivacity and clearness, both of thought and expression; and in his petticoat, which he continued still to encourage in others when he applied himself to more important business. He came to have great notions with relation to all the concerns of the treasury, from public funds, and became more and more master of new and better methods: he showed the error of giving money upon remote funds, at a vast discount, and with greatpremiums, to raise loans upon them; which occasioned a great outcry at the sums that were given, at the same time that they were much shrunk before they produced the money that was expected from them. So he pressed the king to insist on this as a maxim, to have all the money for the service of a year to be raised within that year.' But part of this applies to what was done by Montagu after he became chancellor of the Exchequer, to which office he was appointed on the 1st of November, 1694, to which he was reappointed in 1697, he conjointed that of first lord of the Treasury. In 1696 and 1697 he obtained great credit by his management of the operation of the general receival of the silver money. It was in the latter of those years that, to supply a temporary circulating medium, he contrived what are called Exchequer Bills, the convenience of which species of paper, both for the government and for the public, is 'acknowledged by Money of Montagu's Exchequer bills, however, were for some much lower than any for which such bills are now issued. After he became first lord of the Treasury he was appointed at one time as confidential secretary to the king, at which, in the House of Commons, on the 24th July, 1698, and again in May, 1699. 'In the House of Commons,' says Burnet under the year 1698, 'Mr. Montagu had gained such a visible ascendancy over all that were zealous for the king's service, that he gave the law to the rest, which he did always with great spirit, but sometimes with too assuming an air,' which, subjines Mr. Speaker Onslow, in a note, 'did him infinite hurt, and lowered at last his credit very much in the House of Commons.' Lord Hardwicke, in the speech of the same passage, affirms, that for two sessions together Montagu did not exert himself in the House (for what reason Hardwicke does not explain). To have friends to take the lead, even while he continued in the king's service. He is also asserted to have lost some credit about this time, and to have been thought to have behaved meanly, by staying in the House, in the course of debates on the loans, grants, some information which had been communicated to him in confidence. On the modification of the ministry in November, 1699, Montagu was removed to the authorship of the Exchequer, and the new of first lord and commissioner were given, the former to Lord Tankerville, the latter to Mr. John Smith. In the end of the following year, on the acquisition of the complete ascendency by the Tories, he was removed from the House of Commons by being created Baron Halifax (with remainder, failing his own issue male, to George Montagu, son and heir of his eldest brother Edward Montagu). This, however, was overturned upon the accession of the new master of the House of Commons. The title of Marquis of Halifax had just been extinct by the death of the son of the first marquis [SAYLES, GREGORY, P. C.]; and it fell to Lord Halifax, in a note in the 'State Trials,' ii. 108, Montagu took his title in grateful remember- nace, as he pretended, of the old marquis, who, Dartmouth says, had first brought him into business by recommending him to the clerk of the commons. 'He generally thought more out of vanity (of which he had a sufficient share), in hopes of raising it to such a high degree as his benefactor had done.'

Lord Halifax was impeached by the new House of Commons in April, 1701, along with Lord Somers [P. C., xii. 217] and the Earls of Portland and Orford. The question was carried in the House by a vote of 186 against 154; but the impeachment was not prosecuted, and the charges were dismissed by the Lords. (See the proceedings in the 9th volume of the 'Parliamentary History,' and in the 14th volume of the 'State Trials.') 'The State Trials' exhibited against Halifax were six in number:—1, That he had directed a grant to the value of 13,000l. to pass to Thomas Fanilton, Esq., in trust for himself, out of the forfeited estates in Ireland; 2, That he had received to his own use 1000l. a year out of the said grant; 3, That, while chancellor of the Exchequer, he had obtained and accepted of several other beneficial grants to or in trust for himself; 4, That in 1697 he had procured a grant to Henry, gent., in trust for himself, of wood from the Forest of Dean, to the value of 14,000l.; 5, That while he was chancellor of the Exchequer he had obtained for his brother Christopher the office of auditor, in trust for the use of the Exchequer, and that his brother had advised his majesty to enter into the two partition treaties. [P. C., xvii. 285.] In his answer Halifax maintained that the grants to the Irish of the Forest of Dean were legal, and were also not of the value charged; that there was nothing wrong in procuring the auditorship of the Exchequer for his brother, to be held by him till he should himself be ready to step into the office; and that, as to the partition treaty, he was rather opposed to them in favour of them.

In 1703, after the accession of Queen Anne, Halifax was again attacked by the Commons on the charge of having been guilty of breach of trust in the management of the public accounts while he was chancellor of the Exchequer; and an address was voted to the queen requesting that she would be pleased to give directions to the Lords general to prosecute him. But he was again protected by the Lords; and after some altercation between the two houses the matter was dropped. The proceedings are given in the 'Parliamentary History,' vi. 127, &c. Though out of office during this reign, he continued to take an active part in the debates of the House of Lords, especially distinguishing himself in 1707 in the defence of the 'Sect of Nonconformists.' He, however, complains (note on Burnet, 'Own Times,' i. 431) that he and Lord Wharton brought up a familiar style with them from the House of Commons, 'that has,' says his lordship, 'been too much in vogue in the House of Lords, where everything formerly was managed with great decency and good manners.' To Halifax also belongs the credit of having first moved, and taken the most active part in, the project for the purchase of the Cotton manuscripts and the
establishment of a public library, out of which eventually
eceased the British Linen Company. His relations always kept up a connection 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 meet with the Duke of Cumberland to consider his legitimate
right to the throne; and the Duke, in the event of his
state till his majesty should come over. (On the 14th of
October, 1714), he was raised to the dignities of Earl of Hal-
ifax and Viscount Sunbury, and was restored at the same
time to his father post of first lord of the Treasury, his office
being that 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 came to an end; but he had left his son a
fortune according to the limitation by his nephew George Mon-
taggi, 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 1779, when all the
honours became extinct.

Halifax was one of the most consistent 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 was
of most value, was the value of his character. As a list of his pieces is given by Walpole in his ' Royal and Noble Authors.' His character as a patron of literature has been
determined to be greater than that of the Essayist; and, in the nature
Full-blown Buo,' by Pope, in his 'Prologue to the Satires.'

HALL, REVREBEND ROBERT, was born the 2nd of
May, 1764, at Askby in Northumberland, where his father was,
the same year. He was educated at the Free Church of
Corporation of Particular Baptists. He had come from Northum-
berland, where his forefathers belonged to the class of yeo-
manry; and he is stated to have been a man, though not of
much learning, of considerable native power of mind. He
is the author of several short religious publications: one of
which, entitled ' A Hap to Zion's Travellers,' was several
times printed.

The most interesting 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 cir-
cumstances are obscure, it is an evidence of the imprecation he
had made by his precocity—that he was only eleven years
old, a fellow-clergyman of his father's (Mr. Beoby Wallis, of Kettering), to whom he had been taken on a visit,
simply set him to preach to a select auditory assembled in
his house. His gift of ready expression had, it would appear,
already strongly developed itself. He used to attribute much
of his early intellectual excitement to the conversation of a
metaphysical author, when he was at his native village, a member of his
father's congregation.

He lost his mother in 1776, and it appears to have been
sent to be sent to be
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 preaching 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 1781 he was selected by the authori-
ties of the Bristol Academy to be sent to King's College,
Aberdeen, on what is called Dr. Ward's exhibition; and here
he studied for the usual period of four winter sessions; preach-
ing, at least occasionally, in the intervening summers. It was
at Aberdeen that Hall and the late Sir James Mackintosh,
then also a student at King's College, became acquainted.
They bore a close resemblance in intellectual character, in
their powers of mind as well as in their tastes, and the inti-
macy which now sprang up between them led to an affec-
tionate friendship, which lasted while they both lived.

Hall did not finally leave Aberdeen till May, 1785; but he
had attended occasionally, in the intervening summers. It was
at Aberdeen that he made a considerable acquaintance with
the regular pastors of the Baptist congregation at Broad-
mead, Bristol, in association with Dr. Caleb Evans; and in
August, 1785, he was also appointed by 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. Price at
Birmingham.

He was 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
political than theological. In first instance, then we are to reckon
amongst the anonymous contributions to a Bristol newspa-
paper in 1786-7 was a pamphlet entitled 'Christianity con-
sistent with a Love of Freedom, being an Answer to a Sermon
preached in the Baptist church at Broadmead.' In this
moment of the most ardent minds of that day, he had been strongly excited and
carried away by the hopes and promises of the French
Revolution, and he appears to have retained his first faith without
much alteration in its frame. He met the popular pamphlet, entitled 'An Apology for the Freedom of
the Press, and for general Liberty, with Remarks on Bishop
Horsey's Sermon preached 31st January, 1785.' This
was largely diffused, and brought him much reputation. The
impression that had been made upon him, however, by the
irresistible character of the French revolutionary movement was
indicated in his next publication, ' Modern Infidelity consid-
ered with respect to its Tendency to Social Reform.' It
was the publication of this able and eloquent
sermon which first brought Hall into general notice. From
this time whatever he produced attracted immediate attention.
The Socinian press was not over 1002 for another on the Peace, which also brought him great reputa-
tion.

In November, 1814, Hall was visited by an attack of
sickness, the violence of which did not last long, but from which
he did not entirely recover for some years. His state of
health made it necessary for him to resign his charge at
Bristol, when in January, 1807, he became minister of
the Baptist chapel in Harvey-Jaye, Leicester, and this situa-
tion he held nearly twenty years. He married in March,
1808. At last, in 1826, he removed to the pastoral care of
his old congregation at Broadmead, Bristol; and here he re-
mained till his death, which took place at Bristol, on the 31st
of February, 1831.

Besides occasional contributions to various dissenting perio-
dal publications, Hall published in 1788 an account of
the last twenty years of his life, which, along with those
already mentioned, have since his death been collected and
reprinted under the title of 'The Works of Robert Hall,
A.M., with a brief Memoir of his Life by Dr. Gregory, and
Observations on his Character as a Preacher by John Foster;
published under the superintendence of Olinthus Gregory,
LL.D., professor of mathematics in the Royal Military Aca-
demy,' 4 vols. 8vo., London, 1831-2. It was intended that
the life should have been written by Sir James Mackintosh,
but he died (in May, 1832) before beginning it. Dr. Gre-
gory's Sketch, from which we have quoted the materials of this account, contained in the last of the six volumes.
The first contains sermons, charges, and circular letters (or
addresses in the name of the governing body of the Baptist
church) of those preached in the Baptist churches, in the
Union; two parts, 1816; and another entitled 'The Ess-
tial Difference between Christian Baptism and the Baptism
of John' (a defence of what is called the practice of free
communion), in two parts, 1816 and 1818; the third, political
and miscellaneous tracts, extending from 1791 to 1836, and
also the Bristol newspaper contributions of 1786-7; the fourth
reviews and miscellaneous pieces; the fifth, notes of sermons,
and letters. The sixth, including Dr. Gregory's memoir, con-
tains Mr. Foster's observations, and notes taken down by
friends of twenty-one sermons.

Hall was a man of many virtues, and of intellectual powers
which placed him in the first class of men of talent. His
acquirements were very considerable, and he appears to have
kept up the habits of a studious man to the end of his life.
But the great temporary impression that he made as a preacher
and as a writer is to be attributed chiefly to his general fervent
and fervour of mind, and not much to any higher or rarer faculty.
He was more of an orator or of a rhetorician than of a thinker.
His greatness lay in exposition and in the force of his
eloquence; and this force of eloquence was rather flowing and de-
corative than either imaginative or impassioned. His mind was
not in any sense an original or creative nor even a sublimate one; it
was philosophical, but only by seeing, and not by hearing or
the volumes of his writings, with all their general finish and
eloquence, and occasional brilliancy, although they may preserve
his name from being forgotten, will not greatly interest pos-
terity. They do not contribute anything to the world's stock
of thought or even of knowledge; and are therefore nothing more than a record or memorial of what their author was.

HALL, BASIL, CAPTAIN, R.N., was born at Edin-

burgh in 1788. His father Sir James Hall, Bart., of Dun-
glas, was President of the Royal Society of Edinburgh. He

was a native of the Island of Islay, and was ad-

mitted to the rank of commander; and in 1817 he was made a

post-captain. The opportunities which the naval profession
affords both for scientific pursuits and the study of men and

manner. Some circumstances happened 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 serving
commander of the Thetis on the East India station, he accom-

panied Sir Samuel Hood, the admiral, in a journey over the greater part of the island of Java. Soon after the return to England he was appointed to the command of the Lyra, a small gun-brig, in which he accompanied the expedition which took out Lord Amherst as ambassador to China. While the ambassador was pursuing his journey inland to Peking, Captain Hall in the Lyra, he sup-
porses that one of the principal of which are the models of the sculptures for the pedestal of the Glyptothek, representing Fallas Exagene ('Ephesia, the 'worker'), from a design by Wagner; the six

column stations in the interior of the Glyptothek hall, representing

necessarily Hephastus, Prometheus, Dædalus, Phidias, Pericles,

and Hadrian; and the Caryatides of the royal box of the great

theatre at Munich; besides a basso-relievo in the interior of the

Pergamon temple at Berlin. There are in the library of

the Fall of the Giants; and many busts of eminent men, some

of a colossal size. He executed the bust of William III. of

England for the Walhalla. He died in 1826, aged only thirty.

(Nagler, Allgemeines Künstler-Lexicon.)

HALO is a circular band of faintly coloured light which is

occasionally seen surrounding the disk of the sun or moon at a
distance from them which varies from about one to four degrees.

It is the greatest of all the phenomena of the sun and moon, for

whereas the other phenomena are usually apparent only for a

short time, and usually at great distances, the halo is a daily

phenomenon, visible even on the plainest days. The most

beautiful and the most frequently observed is the lunar halo.

When a mist or a 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

luminous body; this is called a corona; it sometimes appears

when a halo is also seen, but it is more commonly observed

without such accompaniment. The solar corona generally

consists of three concentric bands variously coloured; and in

one which was seen by Newton the colours of the three bands

were successively, proceeding from the sun outwards, blue,

white, and red; purple, blue, green; and pale red; pale blue

and pale red. He stated that the angular diameter of the outer

band was about six degrees. The corona are supposed to be

produced by the refractions of light in the globules of water

which are suspended in the atmosphere between the spec-

tator and the luminous body.

It may be observed in this place that images of the sun

have been occasionally seen as if by reflection from some cloud,

the sun being near the horizon: these are called anstheia; and

Mr. Swinton has seen an anstheia, near the top of a

mountain, details of experiments made with an irreversible

Pendulum in South America and other places for determining

the Figure of the Earth; Observations made on a Comet at

Valparasio. The above three papers are published in the

Transactions of the Royal Society. A Sketch of the Pro-

fessional and Scientific Objects which might be aimed at in a

Voyage of Research. A Letter on the Trade Winds, in the

Appendix to Daniel's Meteorology; with scientific papers in

Brewster's Observations, Jameson's Journal, and the Encyclopedia

Britannica.

Captain Basil Hall having been unfortunately seized with

mental alienation, was placed in the lunatic asylum at Hoxton,

Portsmouth, where he died on the 19th of September, 1844.

HALLE, a flourishing town with a population of above

5000 inhabitants, is situated on the river Sene, in the pro-

vince of South Brabant, 14 miles south-west of Brussels. The town has several breweries, distilleries, tanneries, saltporks, and a paper-mill. It is cele-

brated for the manufacture of beautiful articles of wood, of

which considerable quantities are exported.

(Hassel, Handbuch; Canabich, Lehrbuch; Stein, Hand-

buch, by Hirschelmann.)

HALLER, JOHANN, a distinguished German sculptor,
born at Innsbruck in 1729. He studied in the academy

of Munich, and in his third year obtained the prize in sculp-

ture, for a statue of Thracus raising the Rock to discover the

Sandals of his Father. He executed many works in Munich

for the present King of Bavaria, both as carver and painter.

Of which considerable quantities are exported.

(F.)
some intermediate reflection; or after two refractions with two intermediate reflections. The index of refraction in ice being 1.31, and the prisms equaliteral; it may be proved that, in the first case, the false sun will appear to be at a distance from the true sun equal to 142 degrees, and in the latter case at a distance equal to 62 degrees.

Halos are frequently accompanied by a horizontal ring or band of whitish light passing through the sun or moon, appearing to ascend as the luminous rise, and having its apparent semi-diameter equal to the zenith distance of the latter; and at times a similar band appears in the direction of a diameter perpendicular to the horizon. At the intersections of these bands with the halo (but in a few instances a little beyond such intersections) are sometimes seen images of the sun or moon, which are ill defined and less bright than the true disk of the celestial body, or else the halo is formed about the sun, are called parhelia; and when about the moon, parheliac. Occasionally also segments of circles, or branches of curves of contrary figure, proceed from these images of the sun or moon so as to assume the appearance of wings or tails.

Many remarkable phenomena of this kind have at various times been observed: in the History of England, by Matthew Paris, there is a description of a halo which is stated to have been seen in the year 1233, on the borders of Herefordshire and Worcestershire; it is related that on each side of the halo was a semicircle which intersected the halo in two places; and that at the four intersections were as many false suns. In 1868 Rothman observed at Cassel, soon after sun-rise, a false sun above, and one below the true sun, all being in one vertical line; and in 1890 Belcher observed a remarkable halo at Rome. In 1600 Heredia, at Danzig, observed a single halo, and in 1681 a double halo; the former was accompanied by two false suns at the extremities of a horizontal diameter; and another at the upper extremity of a vertical diameter. In the last-mentioned year Heredia 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 1702; and a very remarkable one was seen by Sir Henry Englefield at Richmond, in 1892 (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 phenomena observed, as above mentioned, by Sir Henry Englefield. The sun being about 14 degrees above the horizon, portions of two halos were seen, one at 94 degrees, and the other at 88 degrees from it; the interior part is sometimes a pale yellow, and a degree broad; and the other, which was about 14 degree breadth, was tinted with prismatic colours, the red being nearest to the sun. On the left hand 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 1° diameter. From the parhelion proceeded a bright curve of contrary figure, being first convex and then concave towards the sun. It extended nearly to the outer circle, and its lower side was tolerably defined, but the upper side was more obscure. In 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 second 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 several other figures, such as is be is the case in the two halos and at the lower extremities of the outer one, the latter being incomplete. The altitude of the true sun was about 23 degrees; and the radii of the two circles were, respectively, 223 degrees and 48 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 spot 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 from the snow which floated in the atmosphere.

In the regions, the sky was often of a peculiar frequent and brilliant: and, near the equator, Humboldt has observed small ones surrounding the planet Venus.

The foregoing, which has been observed by the halo by Mariotte and Dr. Young, is nearly as follows:—Between the spectator and the sun immemorial 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 will follow (the index of refraction in ice being about 1.31 and assuming the angles of incidence to be such that the incident and emergent rays may make equal angles with the surface) that the deviation of the refracted from the incident ray, at the eye of the observer, is about twenty-two degrees. Hence, the incident rays being considered as parallel to one another, there must appear to be formed a circle of light about the sun at a distance from the latter equal to that number of degrees. The semidiagonal of the common halo is rather greater than this quantity; but the index of refraction in ice or snow is uncertain, and the angles of the prisms may, from partial meltling, be rather greater than sixty degrees.

Dr. Young supposes that the rays refracted from prisms so situated may fall on other prisms similarly situated, and may thus suffer two additional refractions at their surfaces; by which means the rays entering the eye of a spectator would form angles of twice the above quantity, or nearly forty-four degrees with the direct rays from the sun; and this may account for the exterior halo. Mr. Cavendish, however, suggested that the latter may be produced by the two refractions which a ray would undergo in passing through face and end of a prism; that is, through two surfaces which are at right angles to one another. Such refractions would cause the incident and emergent rays to make with one another an angle of about 45° 44',; and this is, nearly, the distance of the exterior halo from the sun. The red rays of light, being those which suffer the least refraction, come to the eye from the interior edges of the rings; and hence those edges generally appear of a red colour: the exterior parts should be blue, and they frequently are so; but it may be readily imagined that, with such prisms, considerable irregularities in the order of the colours must take place.

Immediately below of very short prisms, or thin triangular plates, of ice will assume, in the air, vertical positions by the action of gravity; and Dr. Young conceives that horizontal rays from the sun falling on their flat surfaces may be reflected from them to the eye of the observer, so as to produce the appearance of the horizontal circle, or band, of light which so frequently accompanies the halo. Plates of ice disposed so as to reflect the sun's light in a vertical plane may be the causes of the outermost circle to form a vertical diameter of a halo; and a similar explanation may be given of the bands forming oblique diameters such as, on one occasion, were observed by Captain Parry, when the halo had the appearance of a great wheel in the heavens, the sun being
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centre. The blending of the reflected rays above mentioned with the horizontal and vertical bands of light intersect the hall, is, apparently, the cause of the parhelia which are very generally observed in those parts of the hall; and, while we are thus favorably situated for observing a second view from a plane passing through the observer, towards the right or left, the axe being horizontal, there will be produced a curvilinear band of light, like a wing, inclining upwards on each side of the second figure, which is probably of the same kind as the dark one observed by Biot. A cloudy day, pretend that the edifice is not so noisy, and that the horizontal and vertical bands of light are not so visible, and that the refraction is not so apparent—A cloudy day, pretend that the edifice is not so noisy, and that the horizontal and vertical bands of light are not so visible, and that the refraction is not so apparent—

HALO/NIA, a genus of fossil plants, allied to Lepidocar-
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Every facility is afforded for students desirous of copying in the gallery, but permission must be obtained 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, and he who is guilty in any manner of injuring a picture risks an injury 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 favourite resort in the summer; there have frequently been as many as 3000 visitors in a single day. There are two catalogue offices where, for a small fee, you can have a copy of any catalogue, and there are catalogues also in Mrs. Janesson's 'Hand-book to the Public Galleries of Art in and about London,' and in 'The Environs of London,' by John Fisher Murray.

The private Dining-room, 668-690. In this room is a richly-coloured portrait of Fisher the composer, by Gaunbourgh.

20. The Cartoon Gallery, 769-775. This gallery is occupied entirely by the seven cartoons of Raphael (Carrossa, F. C. B.), for which it was expressly built by Sir Christopher Wren, and perhaps there never was a building so ill adapted to its purpose. It is now too narrow, the cartoons are placed much too high, and the light is what is to be desired; but it is at the same time a fine collection of excellent pictures, and dirty.

27. The Anti-room, 778-797. In this room is an admirable drawing in pastel of Raphael's, the one of the Triumph of Caesar, which is in the original in the Vatican at Rome; it was drawn by Giambatita Canova for Lord Balfour, who presented it to George III.; this drawing and the cartoons together show Raphael to advantage in this manner of art. This apartment, though styled the portrait gallery, is chiefly occupied by the nine large distemper paintings of the Triumph of Julius Caesar, painted on canvas by Mantegna for the Marchese Ludovico Gonzagas of Mantua, about 1490, after Mantegna's return from Rome; there are some well-known woodcuts of them by Andrea Andreani. These works are Mantegna's masterpieces, and are among the greatest works of the fifteenth century. As naturalist, however, in a very bad condition, and what is still more to be regretted, William I. had them restored by Laguerre in 1690: they were purchased by Charles I., with the collection of the Duke of Mantua, for about 20,000l., and were sold at the state sale for 1000l., while the cartoons of Raphael were sold for 300l. only. In this room is also a portrait of William of Nassau, Prince of Orange; Dobson and his wife, by Dobson; and a picture of the dwarf Sir Jeffrey Hudson, by Mytens.

29. The Queen's Guard Chamber, 857-928. This room contains several portraits of painters; Henry IV. and Mary do Medici, by Poussin; an excellent copy by Roncalli of Guido's triumph of Boniface VIII.; a excellent copy to Van Dyck, which is a copy of the original picture at Munich. 30. The Anti-room, and, 31, the Queen's Presence Chamber, 925-1025, are devoted to naval battles, maritime views, and shipping generally. 32. The Princess Diana's apartments, consist of many beautifully painted halls of ships of war, by Marshall, and three large pictures of the Battle of Trafalgar by Hugghins.

The great hall is decorated with tapestries of the story of Abraham, said to be made from designs by Bernard van Orlay, a Fleming who studied under Raphael at Rome. They are certainly of the style of the sixteenth century, but are charged in manner; many of the heads, however, are full of character, and the composition is in many parts natural and effective. The colours are much faded, but as tapestries they are of a very superior class: Evelyn says of them in his Diary—'I believe them to have been of the kind than the stories of Abraham and Tobias.' They were estimated in the parliamentary inventory at 8000l.; but they were reserved by Cromwell for the state; the whole history is told in ten compartments, beginning with the story of Abraham and ending with the Battle of Marston Moor, where the English are defeated by the Scots. 33. The public dining-room (14), where there is also a tapestry of Tobias, with the angel, taking leave of his father Tobit, and his mother grieving for his departure. In the large apartment of the gallery, called the great hall, are some of the most splendid and beautiful tapestries, in a superb style of composition; their subjects are allegorical, but the colours are so faded that they are almost obliterated. Above the tapestries are portraits of many celebrated persons of the sixteenth century; they are the cartoons of some frescoes painted by him in the ducal palace at Parma.
having been frivolous in character and prodigal in his habits; he was, however, little more than a youth when he died. As a painter he is considered to have been the foremost of his time. He was the most promising of our painters.'

(Adam Smith, "Wealth of Nations," 1776)

HARRISON, a genus of fossil Crustacea (Trilobites), from the Devonian strata.

HARRIS, [Malmesbury, Earl of, P. C. S.]


HARRISON, 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 effective school for natural 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 Pamphilus; 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 Lame, at Lancaster, at which place he was subsequently employed upon various alterations and improvements in the castle. At Chester, he erected the gool, and the comity courts, which last was considered at the time a very fine and correct specimen of the Grecian Doric style, and the portico central, of which he was himself the originator, though the columns, for though only hexastyle, it has twelve columns, there being a second row of six columns behind those in front. He executed several works at both Liverpool and Manchester, in which account, which was published in 1699, and 1687, in the Tower of St. Nicholas' church; in the latter, the Exchange buildings (since greatly enlarged and altered), the theatre (burnt down in 1648, and now succeeded by the new structure by Mr. Inigo Jones and others, in 1673), 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 classicism of his taste.

Harrison died at Chester, March 29, 1799.

HARRISON, WILLIAM HENRY, late President of the United States, was born in Virginia, 5th February, 1773. His father was Benjamin Harrison, who was a member of the first United States Congress that sat at Philadelphia, and who 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, in Virginia, before he was 13 years old, but spent the first six years of his life spent in military service. In 1781 he received a commission as ensign in the United States 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 by the Indians. After this he was placed in command of Fort Washington, one of the most important defences of the western frontier. In 1791, this war having been brought to an end, he resigned his commission, and was appointed by the Senate in charge of the government of the north-western territory, then comprehending all the country to the north-west of the river Ohio. In 1796, when Indiana was erected into a territorial government, Harrison was appointed to that office, and, continuing 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 to the office of governor of the north-western territory, comprehending all the country to the north-west of the river Ohio. In 1799, when the north-western territory was admitted to the state of Ohio, which, by an agreement of the old government of the United States, was held until the creation of Indiana to a state in 1816. He greatly distinguished himself both in the war with the Indians under the conduct of General Lincoln, and in the treaty with the English in 1812 and 1813. In both these events 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 sent as minister from the United States to Columbia. By all his services was returned the thanks of Congress. On the 4th of March, 1840, he was elected president of the United States, and to that office he was re-elected in 1844. In 1848 he was re-elected to the presidency, and in 1852 he was defeated by Polk, but in 1860 he succeeded to the presidency, having already been twice elected to it. He died at Cincinnati on January 11, 1861, being the first president who died in office. Harrison was a valiant public servant and an able man; but he did not belong to the circle of friends with his predecessors Washington, Adams, Jefferson, and Madison. In his "Essay on the Aboriginals of the Ohio valley," which was published in "The Transactions of the Historical and Philosophical Society of Ohio," vol. i. 1839, he has made some interesting remarks on ancient Indian mounds and on the original state of the forests of America. (See Lyell's "principal work." "The Strata of England and Wales," vol. iv., p. 177.)

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

HARTSOEKER, NICOLAAS, a Dutch natural philosopher, was born at Gouda in 1666; his father, who was a minister of the Reformed religion, intended 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 interpreted a flint tube as possibly doing service for a telescope, he was surprised to observe that the extremity, when melted, assumed a spherical form; and he immediately conceived the idea of using such spheres as object-glasses for microscopes. In an essay which he afterwards published he described the form of the object-glass in detail, and, verifying that the discovered the animals which exist in animal fluids (Lekuinsoeker, P. C.); and, with the like instruments, Latorre 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 Huygens, who encouraged him in the investigation 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 fruitful essays, he succeeded in obtaining some who were superior to any that 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 the intended object-glass to be formed, he fixed it in a frame so constructed that by varying the convexity of the other, and, by friction, brought the continuous surfaces of both plates to equal and consequently spherical figures. In 1694 he published his "Essai de Dioptrique;" and in 1686, in "Les Annales du Cabinet Royal," he attempted to give a general theory of the laws of nature respecting the hardness, elasticity, transparency, &c. of bodies. These subjects he afterwards, explained in detail in his "Principes de Physique," which he published in 1700.

The work was criticized 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 he, at length, lost the good opinion of the nation by urging captious objections to the results of some of his experiments.

Having become embittered 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 incognito, and he was appointed to give the monarch an account of the book. In his conversation he so agreedable to the Czar that the latter invited him to Russia. Hartsoeker however declined leaving Amsterdam, and the magnates of the city built for him an observatory in one of the last houses.

The Elector Palatine having repeatedly offered Hartsoeker the place of professor of mathematics and philosophies at Düsseldorf, he at length accepted it; and, in the year 1704, he went to reside in that city: he made several journeys to different parts of Germany in
order to visit the learned men of the country; and at Han-over he was presented to the elector by the celebrated Leib-nitz, on whose account Heautot had journeyed. Several letters similar to those of Leibnitz were written, and passed between Heautot and the one of these letters was sent to Heautot in 1719. He had been a resident of the English Academy of Sciences in Paris in 1699; and he was also a member of the Academy of Berlin.

Heautot's life was one of turbulent, at one time, an opinion that there existed in every animal a plastic soul which was charged with the preservation and development of the individual; he is said to have maintained also, and this in the presence of the French Academy, that the idea of a form was imparted to Plato in the Timaeus, that, from the divinity descended a succession of intelligent beings, the lower orders of which directed and preserved the universe; he had moreover seen wild notions respecting an empire which he imagined to exist in the interior of the moon.

In 1722 Hasselequist published a work entitled 'Receuil de diverses Piece de Physique,' on the fait principalement vrai l'invalidité du Système de Newton;' he also caused a letter to be printed in the 'Journal des Savants,' containing some absurd remarks on the hypothesis of the English philosopher. He treated Leibnitz no better, attacking with great violence his philosophy, and that of a good many other philosophers. He would never admit the advantages of the 'Infiniment Calculus,' and persisted in considering it as an unintelligible jargon by the aid of which certain learned men sought to entrances the human universe. He placed the hypothesis of Bernoulli as a superficial and an arrogant man; but his violence is supposed to be less owing to envy than to a worldly taste for distinction.

HARTZ. [Germ. F. C., p. 186.]HASSELQUISTIA, a genus of plants named by Linnaeus in honour of Fred. Hasselequist, M.D., his pupil, who travelled in the Holy Land. It belongs to the natural order Umbelliferae, and is placed by Torrey among the species of Techosum that resemble those of Tordylium, and are regarded by some botanists as monstrous forms of this genus.

HAUGHTON, WILLIAM, a dramatic writer, was probably somewhat the jester of Shakespeare. In Henley's Diary, under the date of November, 1607, he is called 'Young Haughton;' and his name occurs frequently in that curious record, till the end of the year 1608; but not later. In March, 1609, Henley lent him ten shillings to pay a debt, for which he then lay in the Clink prison; and constant advances of small sums, in earnest of the price of dramas which he was writing for the old manager, show him to have been not only a poor, but an industrious fellow-playwright. He wrote several plays unassisted; in others his coadjutors were Chettle, Day, and still more frequently Dekker, with whom he appears to have stood on particularly cordial relations. In 1606 there was a license of a tragedy by his, not preserved, called 'Ferrez and Porrez;' and Mr. Collier has conjectured that Haughton's 'Devil and his Dam,' described as a tragedy about the same time, may have been an alter of 'Grum, the Collier of Crydon.' The same critic is more confident in believing that 'The Spanish Moor's Tragedy,' for which, in February, 1608, Henley made to Dekker, Haughton, and Day a payment of three pounds to account, was the wild tragedy called 'Lust's Dominick,' 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 was certainly concerned are two. 1. He was sole author of the lively comedy called 'Engelsman for Money;' or, a Woman will have her Will, which (under the latter title) appears in the Quarto of 1601. It was printed in 1610, 1626, 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 Prince of Pleasure,' acted at the Theatre Royal in St. Martin's Lane in March, 1600, printed in 1603, and reprinted from a very rare copy by the Shakespeare Society in 1841.

HEAUTOT, JEAN DE, a French mechanician, was born in 1676; and in 1692 he caused three burning lenses similar to those of Tschirnhausen to be executed. On the death of the Elector Palatine, Hatzschocker, declining the solicitation of the Landgrave of Hesse-Cassel that he would retire to Unterhosenberg, he died in 1725. He had been 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 was his designation, devoted himself to the study of subjects connected with physical science, and to the construction or improvement of instruments; but he is distinguished chiefly by the claims which he advanced in the year 1722, on the honour of having invented a spring 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 balance in the same form; 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 subsequently withdrew his application. It is remarkable that Dr. Hooge had, about the year 1658, invented a balance-spring for watchwes, 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 Huygens and Hautefeuille were in use in Paris.

The other applications of 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 entitled 'Receuil des Ouvrages de M. de Hautefeuille,' which is a large volume of engravings; one account of a pendulum clock in which the weight was to be raised by the action of the atmosphere; a method of raising water by means of fired gunpowder; and an account of some improvements in sundials 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 description 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 (1658); 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 ' Dissertation sur la Causa de l'Echo,' which had been read before the Academy of Bordeaux in 1718, and was published in that year in 1724.

Hautefeuille appears to have been in haste to publish his ideas as soon as they arose in his mind, without waiting to consult with others; and sometimes he forced them to the text of experiments; as it appears from some of his projected schemes of observation 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 company which he maintained to the Sciences though he ardently desired that honour. He died October 18th, 1755, being then seventy-seven years of age.

(Histoire Universelle.)HAWEER, [PEDIAS, 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 Tiers, the proprietor of Vauxhall. He also made many designs for bookshellers, the best of which are those for the Pictures of the Life and Writings of Shakespeare. He was the first librarian to the Royal Academy; he died in 1776. (Edwards, Anecdotes of Painters, &c.; Somerset House Gazette, 1824.)HEALTH, PUBLIC. [CONFORTABLE, P. C.]HEALTH, PUBLIC. [Public Health, P. C. S.]HEARSAY. [EVIDENCE, P. C.]HEAT. [ABSTRACTION AND ABSORPTION OF HEAT, P. C. S.; Climatic, P. C.]HEAT, ANIMAL. The conversion of the food of man and the higher animals into animal heat the body is attended with changes which produce an emission of heat which constantly continues to change the temperature of a body, and which is not entirely at the disposal of the animals. 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 heat system most exercised there is greatest demand made upon the nutritious processes going on in the system. We should therefore expect to find that the quantity of heat developed in the invertebrate animals was less than that in the vertebrate class. Infusoria are in a time capable of resisting cold; for when the water in which they are contained is frozen, the animalcule is observed to live for a time in a little uncoagulated space which is transparent from its body not resisting. John Hunter found that various forms of Annellida, 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 2° to 9°. With respect to the temperature of the different tribes, Mr. Newport observes, 'Our previous observations lead us to anticipate the higher temperature in those 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 by far the highest are those of the highest temperature which pass nearly the whole of their active condition on the wing in the open atmosphere, either busily engaged in the face of day despolling the blossoms of their host, or flying wanton 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. Next to these are placed the volant enemies of the bees, the hornets and wasps, 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 voluntary 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 sphinges and moths; and almost equal with them are the Melolontha. 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 soil. Amongst the vertebrate animals, fishes and reptiles have the lowest temperature. Dr. Davy, John Hunter, and others, have found that fishes have a temperature of from 7° to 9° 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 heat of a blood in summer is from 96° to 98°, while in winter it varies from 100° to 101°; in disease it rises to 105° or 106°. In healthy persons the temperature is said to attain its maximum during the day, and to fall from 1°8 to 2°7 during sleep. Dr. Davy has also found that the temperature of the interior of the body is 2°7 to 3°6 higher than in temperate climates. Most of the Mammla 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 Rudolph and Tieffenberg, for several birds and Mammalia.

<table>
<thead>
<tr>
<th>Birds</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bat (Vesperillo pipistrellus)</td>
<td>106 to 106</td>
</tr>
<tr>
<td>Squirrel</td>
<td>106</td>
</tr>
<tr>
<td>Ox</td>
<td>104</td>
</tr>
<tr>
<td>Rabbit</td>
<td>109 to 94</td>
</tr>
<tr>
<td>Ace</td>
<td>103-86</td>
</tr>
<tr>
<td>Cat</td>
<td>109-96 to 99-94</td>
</tr>
<tr>
<td>Bat (Vesperillo noctula)</td>
<td>103-87</td>
</tr>
<tr>
<td>Dog</td>
<td>103-95 to 98</td>
</tr>
<tr>
<td>Guinea Pig</td>
<td>100-94 to 99-97</td>
</tr>
<tr>
<td>Hare</td>
<td>100</td>
</tr>
<tr>
<td>Elephant</td>
<td>99-25</td>
</tr>
<tr>
<td>Horse</td>
<td>100-94 to 97</td>
</tr>
</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 expiration. 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 this peculiar property of the bodies of animals 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 out of the system; and this is the cause of the heat; 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 scarce coverings, where the blood is only imperfectly oxygenated, and the cold experienced by aged and debilitated persons in whom a small quantity of blood circulates slowly; and also the increased temperature observed in persons labouring under attacks of inflammatory disease where the blood circulates rapidly, are also confirmatory facts. The phenomenon also exhibited by the hibernation of animals are explained by this theory. During the period of hibernation, when the blood is circulating slowly and respiration is almost suspended, and the oxygenation of the blood is feebly performed, the temperature of the animal is low. The observations ofopal and others show that hibernation is prevented by a temperature of from 95° to 90°, 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 dependent on the mass of the globules of the blood and the regularity 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 circulatory system alone causes the consequence that there is less heat 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 auxiliary 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 11° to 18°. Since the act of metamorphosis 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. (Sim.)

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

HEBER, REGINALD, second Bishop of Carlisle, was born April 21, 1788, at Hespe, 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 heirs-male, the father of Reginald Heber succeeded him as rector of Holy Trinity, Marton, Yorkshire, and patron of the rectories there, and to estates at Hodnet, Shropshire, which had come into the
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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 through life whatever he read with almost verbal accuracy. He was early versed in the Scriptures, and at seven years old he had translated Phaedrus into English verse. At eight he was sent to the grammar-school of Hawkhurst under Dr. Kent, and in his thirteenth year he was placed in the school for clergymen near Lichfield. 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 not of a very singular character; the amiability 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, but a fondness for language and literary views than is usual with most young men at the universities. In 1804 he became a Fellow of All Souls. The year after he had taken his degree he gained the Bachelors' prize at Oxford, in this branch of 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 Russia, Poland, Hungary, Austria, and the Crimea, 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 Heber's Hill. His history at this time is a 'depressing way situation between a parson and a squire.' 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 earnestness 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 a concordance to the history of the Bible, and the laborious work, which he labored with much delight, but other duties compelled him to suspend this work, and no part of it was ever published. In the same year he published a small volume of 'Poems and Translations,' which was reviewed in the 'Church Observer.' 'The Hymns,' 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 disgust for controversial theology, and only once was engaged in a discussion of this kind, in reply to what he conceived were the unwarrantable impugnations 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. His political views were those of the High Church and Tory party, but devoid of all intolerance. 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 was appointed Lapponian lecturer, and the subject he selected was 'The Personality and Office of the Christian Comforter.' In 1817, Dr. Luzmore, the Bishop of St. Asaph, appointed Heber to a stall in that cathedral. He now left his father-in-law, the Dean. In 1819 he edited the 'Tracts for the Times.' The other works consist of 'Parish Sermons' preached at Hodnet; and Sermons preached in India. In April, 1822, he was elected a member of Lincoln's Inn, for which he had formerly been an unsuccessful candidate. The 'Parish Sermons' and 'Tracts for the Times' were reprinted in book form.

Heber was remarkable for his piety and eager thirst for knowledge. His memory was excellent, enabling him to recollect through life whatever he read. He was early versed in the Scriptures and had translated Phaedrus into English verse at eight years old. In 1803, he gained the prize for Latin verse at Oxford. He went on a continental tour with his friend Mr. John Thornton in 1805. In 1807, he took orders and was instituted as a parson in the family living at Heber's Hill. He conducted his parish with zeal and benevolence. He was a frequent contributor to the 'Quarterly Review' and published a volume of 'Poems and Translations' in 1812. He also wrote 'The Hymns' and 'Parish Sermons' as well as 'Tracts for the Times.' He was appointed Lapponian lecturer in 1815 and later became a member of Lincoln's Inn in 1822.
HECTOR ('Euryp'), the greatest of the Trojans heroes who figure in our accounts of the Trojan war. He was the son of Priam and Hecuba, and married to Andromache. The poet of the Iliad personifies him as the very type of a bold and gallant warrior, whose martial spirit likewise to his heart, 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 real motives of human life than with any. 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. 300 sq.), where Hector, about to battle, takes leave of his wife and child, and where (xiv. 3), amid the lamentations of his parents, he prepares himself for the contest with Achilles. Wherever the battle is fiercest, Hector is foremost, and, protected by his father, As (Max) and Apollo, he fights most vigorously against the bravest of the Greeks, such as Ajax, Nestor, Diomedes, and Teneus. He was foremost among those who stormed the Greek camp, and advanced as far as the place where their ships were stationed. Patroclus then came forward and drove the Trojans back to their city, but was slain by Hector. This calamity for Achilles from his inactivity, and, thirsting to avenge the death of his friend, he sought Hector, who, though inspired by his parents to save himself, resolved to engage with his enemy. Achilles thence chased him round the walls of Troy, and finally pierced him with his spear. Hector bore his arrows with his^ and dragging his corpse clung and dragged along 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 dog; but Achilles, in the contest with a dog, dragged the hero, who, when he appeared as a suppliant before him and begged for it, the remains of Hector were buried at Troy, where funeral sacri- fices were offered to Hector as a hero; at a later time, however, his remains are said to have been conveyed to Thessal., in pursuance of an oracle. (Pausanias, iii. 18. 9; ix. 18. 4.)

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

HEDYPSARUM (from ἥδυπασα, the Greek name of the Coronilla secundaria), a genus of plants belonging to the na- tural order Leguminosae. It has a 5-5cleft calyx, with the segments linear-subulate and nearly equal; the corolla with a large vexillum, and obliquely truncate; keel much longer than the wings; the stamens didymous; the legume of num- erous flat orbicular or lenticular regular 1-seeded joints, which are connected together in the middle, and therefore the sutures are convex on both sides. The species are herbs or under-shrubs, with unequally pinnate leaves, axillary, with simple peduncles, and browning racemose spikes of large purple, white, or cream-coloured flowers. The old genus Hedypas has been subdivided into many smaller genera, as (beneath) (Genus) and (S) by old writers, who form the genus Onobrychis, which differs from Hedypas in the legumes consisting of many joints, not of one joint, as in this genus. It is a native of Spain and Italy. Hedypas grows wild in great abundance, and horses and mules are fed 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 leaves, which are clothed with pubescence on both surfaces; the flowers few, disposed in spikes; the wings hardly longer than the vexillum; the vexillum the length of the keel; the joints of the legume wrinkled; the seeds slightly echinate. It is a native of Siberia in sandy places. It has a pale purple flower, and is a very handsome plant. Horses eat it with avidity, and it may be made useful in fixing sand, in which it grows readily.

H. Macenaei has recumbent stems; the leaflets oblong, clothed on both surfaces with cuneate pilis; the stipules sheathing; the joints of the legume transversely wrinkled and plicate. It is a native of Greece, Abruzzi, and North Italy.

H. lutescens is used in Cochín China as a stomachic, and H. alpinum is used in Siberia for the same purpose. The P. C. S. No. 88.
reason, very considerable. His works are not indeed without the influence of his time, and the demand of our age; but it must not be forgotten that Hegel was the first historian, at least in Germany, who breathed life into the history of antiquity, saw in it something more than a mere succession of facts, and lifted it to a level with the more peaceful pursuits of the antients and their principles of government. In his private life he is said to have been a man of the most gentle and benevolent disposition.

(For further particulars of his life, see the Heerden's Letter to a friend in the first volume of his historical works, and Karl Hocke, A. H. L. Heenan, eine Gekrichtsnrede, Göttingen, 1843, 4to. A complete list of his works may be found in the 'Verzeichnise der Bruchstücken' in the Universitats Göttingen, vol. ii. p. 194; vol. iii. p. 344; and vol. iv. p. 442.)

HEGESIAS (Hegesiás), 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 of some importance in antiquity, though more for his bad than for his good qualities. Strabo (xiv. p. 649) 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 ('Brev. 68'; 'De orat. iv. 7') and other historians. He is mentioned as one of the Attic orators, especially Lysias. He seems to have been destitute of all the qualities required of an orator, and to have talked more than he wrote. His oratory was never more than expressive of his person. 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 'Schriften seiner Zeitgenossen,' and in the 'Nekrolog' of 1838.

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, Phorus, and Plutarch ('Acer. 3'); and A. Gellius (ix. 4) does not appear to be much mistaken in classing him among those who, unconcerned about historical truth, filled their books with nothing but stories and incoherent chimeras. (Compare Strabo, ib. p. 396; Longinus, De Sublim.; Theon, Progymnasm.; St. Croix, Examen critique des Historiens d'Alexandre, p. 47, &c.)

From this Hesiodus we must distinguish HEGESIAS the Cyranec philosopher, who lived somewhat earlier, in the reign of Ptolemy Philadelphus, and was a disciple of Parabataes. His doctrines, however, differed in several points from those of other Cyneces, and so much so that his followers were regarded as a distinct school, and are called as such Hegesiac (Hegesiak). In the main points they agreed with Aristippus, the founder of the Cyneces school, who maintained that happiness is in the power of an individual, but Hegesias and his school went further; they denied that kindness, friendship, and benevolence had any independent existence, but that they arise and disappear with the feeling of the individual, and are nothing more than things possible to attain, for our body is subject to many sufferings, and the soul suffers with it. Life and death are equally de- sirable; nothing is by nature either agreeable or disagreeable, but becomes so through the circumstances in which it is made. 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 down and improved by Anniceris, the disciple of Hegesias. Hegesias wrote a work entitled 'Areaprepsev, in which he introduced a person related to Socrates, and explaining to his friends why 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 Philadelphus is said to have forbidden him to teach any more. (Diogenes Laert., ii. 86, 93-96; Cicero, Tusc. i., 84.)

HEINRICH, CARL FRIEDRICH, a distinguished 'german scholar, was born on the 8th of February, 1774, at Münster, in Westphalia, the son of the pastor. He received his first education at the Klosterschule of Dondorf, and afterwards at the Gymnasium of Gotha, where he enjoyed the instruction of Döring, Manno, Jacob, and other pupils of the principal Greek writers, even before he entered the Gymnasium, and his intimate acquaintance with them caused him to be looked upon as a wonder in town. In 1791 he went to Göttingen,
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.

(Don, Gardiner's Dictionary; Bahnhoff, Manual of British Botany; Leuton, Encyclopedia of Trees and Shrubs; HELIOTROPIUM (from ἥλιος, the sun, and πτωτος, a turning), a genus of plants belonging to the natural order Eriocaulaceae. It has a saucer-shaped corolla, with the throat united, but the segments behind the limb furnished with a single fold or a tooth between each; the stigma sub-casual; the carpell 4, 1-celled, combined, closed without any manifest receptacle. The species are annual or shrub plants with alternate leaves and circular spikes of small blue or white flowers.

H. Parviflora, Peruvian Heliotrope or Turnsole, has a shrubby stem, pinnate oblong-linear somewhat toothed leaves, terminal branched spikes; the tube of the corolla hardly the length of the calyx. The mouth of the corolla is intersected with five plumes of a purple-lilac colour with a greenish throat. It is a straggling, growing one or two feet high, and 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 Heliotrope, has an herbaceous erect stem, with ovate flatly finely tomentose leaves, the lateral spikes solitary, the terminal ones conjugate, the calyx spreading in the fruit-bearing state. It is a native of Greece and of the islands of the Archipelago. It has large white corollas with a yellow throat. This appears to be the Heliotropium pumilo of Dioscorides (iv. 60), and the H. hypogynum, the Heliotropium pumilo.

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 bear the propertion of flowers.

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 perfumers for the sake of their volatile oil. They are aromatic and also medicinal, and poultices made of the leaves have been applied to cutaneous and scrofulous sores. It is supposed that the plant used for the cure of warts, and called 'Verrucaria,' 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 glass. The European annual species may be propagated from seeds, and border the borders, while the shrubby and perennial species must be sown upon a hot-bed before being planted out.

(Don, Gardiner's Dictionary; Burnett, Outlines of Botany; John Garbett, Flora Classic.)

SINUS, (HEL. MAXIMILIAN, a distinguished astronomer and member of the order of Jesuits, was born May 16, 1720, at Schönmitz 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 1748 he was made rector of an academy at Leuchtenburg in Hungary; but this post he held only one year, when he returned to Vienna. Here he completed his theological studies, and made a small number of observations, which were afterwards taught in mathematics. He took orders in 1761, and after three years he obtained the rank of doctor, with an appointment to the professorship of mathematics at Claussenburg in Prussia. Remaining continued for several years, 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 period of his life. Besides the various observations, he was charged with that of giving lessons in mechanism; as, in England, about eighty years earlier, the first astronomer royal was required to teach the use of nautical instruments to young boys from Christian schools. But in this situation he was situated for twenty to twenty-five years. A brother of Hell was a distinguished mechanician at Schönmitz, and in the invention of the clock of the sun-clock, which he was engaged in making, he was aided by the young man who is now, by the naked eye, 1775 + 400, and one on a New Theory of the Aurora Borealis, 1776.

All his works were published at Vienna; and he died in that city in 1788, aged sixty-two years. A brother of Hell was a distinguished mechanician at Schönmitz, and in the invention of the sun-clock, which he was engaged in making, he was aided by the young man who is now, by the naked eye, 1775 + 400, and one on a New Theory of the Aurora Borealis, 1776.

The mediation of Count Bechhofer, 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 Walhoy in Lapland, in order to observe the transit of Venus over the sun's disc. Accordingly he set out from Copenhagen, and, after spending a short time at Copenhagen, he proceeded to the place of his destination: he was absent about two years and a half on that mission, when, having successfully carried out his object, he returned to Copenhagen; but the proceedings became so public that he took advantage of his residence in Lapland to study the geography, the natural history, and the climate of the country; the history, language, and religion of the people, with the state of the art of agriculture. In the latter he was promoted to the degree of professor of the observatory, and on the phenomena of the tides and winds, and on the variations of the barometric 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 conclusion of the phenomena; and the accuracy of his observations that the value of the sun's parallax, which he deduced by comparing them with the corresponding observations at certain other places, agreed, within one-fifth of a second of arc, 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 in any foreign language, until the Danish Astronomer Royal had made all the requisite computations. The delay which, in consequence of this injunction, took place in making Hell's observations public, gave offence to Langand, who had, by letters addressed 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 on matters 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, 4to., the collection being entitled 'Ephemerides Anni 1757—1791 ad Meridianum Vindobonense Calculi definiti.' With the exception of two volumes, these contain appendices on astronomical subjects by himself or other scientific men, chiefly by Pilgram and Trisonneker; the former of whom edited the work during the absence of Hell in Lapland. The rest of his publications on astronomical subjects are as follow:—

Tabularium Astronomicalum Annualum, 1759; Reliquarum Tabellarum, 1763; Tabulae Lunae, 1763; Mayer cum Supplemento, etc., 1763; De Salis, 1765; De Transito Veneris ante 1767, 1765; De Transito Veneris ante 1767, 1769; Watabrii, 1769; De Paralliali Solis, 1769; De Revolutionibus et Transitibus Veneris, anni 1769, 1773; and Methodus Astronomiae sine Ursi Quadrantis, etc., 1775. He also edited a collection, which had been made by Halberstein, of the astronomical observations made by the Jesuits at Pekin from 1717 to 1752; this was published at Vienna in 2 vols. 4to., in 1768.

Besides these works he published 'Elementa Algebrae J. Crivelli,' 8vo., 1745; 'Admonitum Memorae Manuale Chronologico-Geologico-Historicum,' 16mo., 1750; 'Elementa Arithmeticae Numericae et Literales,' 8vo., 1763; also a tract of 'Tabulae Anomaliarum,' which had been seen by the naked eye, 1775, and one on a New Theory of the Aurora Borealis, 1776.

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HELSTON, a market town and parliamentary and municipal borough, in the hundred of Kerrier or Kierrier, 'in the county of Cornwall, 296 miles west south-west of the General Post Office, London: viz., 197 to Exeter by railway, and from thence 99 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. made it one of the coinage towns; and it sent members 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 so neglected that it was pulled down in the time of Edward III., and nothing now remains of it. The Saxon name 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 called the Loe, now called the Loe, which flows below the town a wide expanse of water called Loo-pool. The river Hel or Helil, distinguished from another stream of the same name in the county, as the Helil in Kierrier, and sometimes called the Halford, 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 town-hall 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. 1768.

There are a baptist meeting-house and a Wesleyan chapel.

The population of the old borough and chapelry which has an area of 136 acres was in 1841, 3844; the number of houses was 765, viz., 682 inhabited, 66 uninhabited, and 15 buildings.

The number of houses in 1831 was only 616, viz., 561 inhabited, 23 uninhabited, and 12 buildings; the population was 2693, 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 mining district: it has two markets, on Wednesday and Saturday. When about six miles near the town are five other markets in the year. A great number of shoes are made in the town, and sold at the markets and fairs; or are sent to London, where they are retailed in the two large retail shops. The Act returned two members, now returns only one; the old borough was, for parliamentary purposes, enlarged by the addition of the adjoining chapelry of Sithney and of a considerable part of the parish of Wendron. The population of Sithney parish in 1841 was 3052, of Wendron 6576, which, united with the population of the old borough, makes a total of 12,522; but what deduction is to be made for that part of the parish of Wendron which is now a parliamentary borough we have no means of ascertaining.

The number of electors on the register in 1832-5 was 326, 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 commission 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 chapelry of Helston is a dependency: the clear yearly value of the united benefices is 872l., with a glebe of 13 acres. The living is in the archdeaconry of Cornwall and the diocese of Exeter. They were in the chapelry of Helston in 1833 two national schools with 100 boys and 70 girls partly supported by subscription; and 20 boys and 20 girls with 40 children of sex not stated, giving a total number of

589 children, or about one in eight of the population (according to the then recent census of 1831) under daily instruction. There were at this time (1832) two Sunday-schools, with 260 children, viz., 127 boys and 133 girls connected with the two dissenting congregations.

(Stonydown, *Manual of British Botany*.)

HELVENNA, [LYSONS], FELICIA DOROTHEA, was born September 25, 1794, in Liskeard, Cornwall, where her father was commercial agent at Liverpool for the Venetian government. Felicia Dorothes 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 Grywych, not far from Abergele, in Denbighshire, North Wales. Mr. Browne died not long afterwards. Felicia Browne began to write poetry 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 1816, and composed in a few months, viz., when she was between 1803 and 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 Hennems, of the fourth regiment. His constitution had suffered so severely in the retreat upon Corunna, and subsequently by fever caught in the disastrous Welcheren 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. Hennems, with her five sons, went to reside with her mother, then living at Brownwell, near St. Asaph, in North Wales. Mrs. Hennems 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, Herers, 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 published in 1815; 'Tales and Historic Scenes,' in 1819; and, about the same time, 'The Sepulchre,' a didactic poem, in heroic rhyme; and 'Modern Greece,' in ten-line stanzas. Her poem of 'Dartmoor' obtained the prize from the Royal Society of Literature in 1821.

In 1827 Miss Browne became acquainted with the Rev. Reginald Heber, afterwards Bishop of Calcutta, who passed a part of every year at Bodrhyddan, near St. Asaph, and their acquaintance soon ripened into friendship. At his suggestion she undertook the literary work, the tragedy of 'The Vespers of Palermo,' which was represented at Covent Garden Theatre, London, in 1828. It was unsuccessful there, but was afterwards better received at Edington, when Walter Scott wrote an epitraphe for it. 'The Siege of Valencia, the Last Constantine, and other Poems' was published in 1828.

In 1835 Mrs. Hennems was divorced, with her mother, her sister, and her own sons, to Rhyllon, 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. Hennems'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 Heber's 'Stimmen der Gegenwart,' Hone, M.R.C.S., prefixed 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 Rhyllon, and many are from facts which the melancholy occasioned by the recent death of her mother, for whom her affection was always exceedingly strong.

In the autumn of 1828, on the marriage of her sister, and the removal of her family, Mrs. Hennems was left alone, Mrs. Hennems established herself at the village of Waveney.
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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 was annoyed by visitors, prevented from attending social parties, and complained with some bitterness of 'this weary celebrity.'

In the early part of the summer of 1829 Mrs. Hemans paid a visit to Miss Abbeville's school in Edinburgh, where she proceeded to Chiewford, in Roxburgshire, the residence of the author of 'Cyril Thomson,' and was there introduced to Sir Walter Scott, with whom she afterwards spent several days. She returned to Edinburgh in August, and thence proceeded home to Wavertree.

In 1830 she published another volume of poetry, 'The Songs of the Affections,' and in the same year paid a visit to the lakes of Cumberland and Westmorland. She remained a fortnight with Worthaworth 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 returned to Wavertree, 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 rapidly improving, to which 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 be a stormy world alone,' precluded her from any more hopeful life which was her desire.' In November, 1831, after a visit to her brother in Kilkenney, 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 which I have ever experienced. It was accompanied by almost daily fainting fits, and a languor quite indescribable. 'And not long afterwards, in another 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 were desperate effusions,'

'Pouring myself away,'
As a wild bird amidst the falcon's tears
That within him thrills and beasts and burns
For all who have a heart.'

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 1844, 'Hymns for Childhood,' 'National Lyrics and Songs,' and 'Scenes from the Lives of Napoleon.'

In August, 1834, Mrs. Hemans took the scarlet fever, and when imperfectly recovered, caught a cold; she was seriously indisposed, and never left her bed till she was subdued by her last fit. It was the illness which virtually decided she had caused an unequivocally dangerous aspect. 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, when, after a long and quiet sleep, she died without a sigh or movement. She was buried in St. Anne's Church, Dawson Street, Dublin, which is closed by a tablet engraved on which she died. A tablet was 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 greatly admired for the brilliance of her complexion, her golden hair, and her remarkably clear and mobile face. The latter and more golden hair, in her mature years; her hair darkened into auburn, of a silk-like softness, and very long and abundant. In her aspect and movements there was something more than natural animation. She was notacute and incisive, but she was sensible and unreservedly honest and open to the 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 Wavertree, discovered in herself a faculty which gave her much gratification—that of composing melodies; she could sometimes find passages of fine music for some of her poems, and sometimes set to music a song or lyrical piece already written. Among her friends she was distinguished by much vivacity and a very delicate wit. She was kind and unaffected in the exercise of her many charities towards the other female writers of her day, with most of whom she was on terms of friendship, either personal or by correspondences—with Joanna Baillie, Miss Milford, Miss Londonderry, Mary Lamb, Mrs. Thrale, Mrs. Bannister, Mrs. Howitt, and others. 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 poetical and philosophical contemplations which, fascinating and unbounded, 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 nature, something she usually 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 whose the most characteristic is that of a lover of sweet and lyric and descriptive, filled with imagery, sometimes overflowing with it. She has no dramatic power; she cannot enter into the thoughts and feelings of others: she can only exhibit her own. She is not tragic, and she is no epic poet; the actions and sentiments of the characters are above nature or out of it, and the diction is not dramatic, but poetical, and monotonously uniform from prince to peasant. Her verisimilitude has three distinct styles. Her 'Domestic Affections,' and other early poems, are obviously modelled on 'The Pleasures of Hope,' of Campbell; her 'Tales and Historical 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 whether in blank verse, in couplets, rhymes, in stanzas, or sonnets, or in the varied measures of lyric poetry, exhibits in its free 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 a tendency to cloy uniformity. Her great defect is the similarity of tone and expression in all her works. Many of her lyrical pieces are exceedingly beautiful. (Chorley, 'Memoirs of Mrs. Hemans; HEMEROBIUS, a genus of insects of the order Neuroptera and section Planipennia. The genus, as established by Linnaeus, has been dismembered by subsequent entomologists, and is now equivalent to a family distinguished by the filiform antennae and by the number (four) of the palp of the insects included in it. They have soft slender bodies, much exceeded in length by the large rounded wings, which, when the animal is at rest, are folded. Their eyes are globular and vividly metallic. The larve are ferocious in habit, and prey upon plant life, seining them with their powerful jaws and sucking their prey to death. When full grown, the larve hew themselves into the soil, and pupa. The eggs of Hemerobius 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 are about seven species native of the British Isles.

HEMICIDARIUS, a genus of fossil Echinozoa, from the col tit.

HEMIPNEUSTES, a genus of fossil Echinodermata, from the chn.

HEMIPHYTRA, a genus of fossil Polyazaria, in the beds of Devonshire, allied to Fenestella. (Phillips.)

HEMILING, HANS. [EMLING, HANS, F. C. S.]

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afford, he was apprenticed to a writer (or attorney) for six years. At the end of this term he was sent to Edinburgh, at the age of twenty-one, to complete his legal instruction. He was then apprenticed to Mr. John Clerk of Eldin, the Earl of Lauderdale, and the Lord Advocate Jeffrey, and in these employments he continued to 1831.

During his residence at Dundee he acquired a taste for practical astronomy, as well as for the history and literature of that science. At Edinburgh he frequented the observatory, then a small and insecure building, to which he applied to give valuable opportunities to a learner. Weak health and a tendency to disorder in the eyes are very poor aids to an astronomer, but they did not hinder Mr. Henderson from bringing himself into notice, though his scientific pursuits could only be the relaxations of a life of business. In 1824 he began to communicate with Dr. Thomas Young, then superintendent of the Nautical Almanac, whom he assisted both by methods and calculations. The consequence was, that at Young's death it was found that he had placed in the hands of Professor Rigaud a memorandum desiring that the Admiralty might be immediately informed, as soon as his death should take place, that he knew of no one more competent than Mr. Henderson to be appointed his successor. The government, however, confided the trust to Mr. Pond, the astronomer royal, who immediately offered Mr. Henderson to succeed him in the charge of the observatory at the Cape of Good Hope, and later in the post of Astron. Adm. When the date of his arrival at the Cape, he must be considered as a professional astronomer.

After vigorous application to his duties for little more than a year, he found his health and spirits give way. His isolated position and separation from his family, accompanied by the knowledge that he was subject to a disorder of the heart, which might at any time, and which finally did, prove fatal, made him wish to return to Scotland. He came back accordingly in 1833, with a rich store of observations, the refection of which he imposed upon himself as a voluntary duty. In 1834, by an agreement between the government and the Astronomical Institution of Edinburgh, the latter gave up their observatory to the University, the former agreeing to appoint and provide for an astronomer, who was also to hold the professorship of practical astronomy in the University. On the recommendation of the Astronomical Society of London, to whom Lord Melbourne applied for advice, Mr. Henderson was appointed the first astronomer royal for Scotland. Here, in the midst of his friends, and in the position which, of all that could have been imagined, he would have chosen for himself, he pursued his observations and researches till his death, which took place suddenly, November 20, 1838.

A very full account of Mr. Henderson's astronomical writings will be found in the annual report of the Astronomical Society for 1846, with a list of his writings, which consist of papers on the determination of the parallaxes of magnitude and importance, to different scientific publications, independently of the volumes of observations which issued from the Edinburgh Observatory. We might particularly what he did on occultations, on the solar and lunar parallaxes, &c.; but it will better suit our limits and the nature of the subject, to refer the reader to the memoir just cited, and to confine ourselves to a mention of the manner in which his name is connected with the discovery of the parallaxes of the fixed stars. [PARALLAX, P. C. J. M. HEN- Derson, when at the Cape, repeated the attempt in which Brinkley had failed, namely, the detection of the effect of parallax upon the motion of the stars. The results were a' and a Centauri; and the results derived from the former star show discordance, both in right ascension and declination, very much resembling those which parallax would cause. Mr. Main, in his elaborate investigation of the modern claims upon this subject (Mem. Astron. Soc. vol. xii.), says that in the event of a parallax at all comparable to that anticipated by Mr. Henderson, it would tend to the star, he will deserve the merit of the first discovery. Mr. Maclear, Mr. Henderson's successor, made a new series of observations on the same stars, with a different instrument, from which Mr. Henderson produced results very nearly agreeing with his own.

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 his profession a spirit of independence; and his intercourse with Mr. John Clerk of Eldin, the Earl of Lauderdale, and the Lord Advocate Jeffrey, and in these employments he continued to 1831.

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HENRICO CATTERINO DAVILA, born at Pieve di Sacco near Padua, was the son of Antonio Davila, who was great constable of Cyprus when that island was taken by the Turks from the Venetians in 1571. Antonio emigrated to England, where he had relations, and afterwards to France, where he won the favour of Catherine de Medici, and of her son King Henri III. Lastly he went to reside in the Venetian States, where a son was born to him in 1597. In 1618 he received the title of Sir Henry Davila, in the year of his death, and was severely wounded at the siege of Honfleur. In 1599 he was recalled to Pieve di Sacco by his father, who soon after, in a fit of temporary insanity, put an end to his 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 1631 he was appointed to take the command of the garrison of Crema, with or without the assistance of the postmasters on the road to supply him with every conveyance required for the service. On arriving at the stage of St. 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 1598, a period of forty years most eventful in the history of that country. Ho trends, therefore, upon the same ground as De Thou in his 'Histoire sui Tempora.' Some critics have noticed that Davila had a great passion for novelty, and especially for Catherine de Medici, 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 uncle, who was a soldier in the French army. 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 quoted as a specimen. 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, adapting itself nimbly to circumstances of subordinate importance, and dwelling chiefly upon those on which he has materially affected the interests either of religion or the state. By common consent Davila is numbered among the best historical writers of Italy. 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 Secoli della Letteratura Italiana.')

HENRYSON, ROBERT, a Scottish poet of much merit, lived in the latter part of the fourteenth century, but of whom hardly anything is known. He is supposed to have been the
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Robert Henryson whose signature as notary-public is attached to a charter granted in 1478 by the abbey 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 the son of a merchant, and it is consequently supposed that he might have been a Benedectine 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 'The Pattern and Proper of the Duke of Chevreux' appears in a manuscript of the manuscript of that poet's works. His beautiful pastoral of 'Rohin and Makyne' is known to most readers from Percy's 'Reliques.' Other specimens of Henryson's poems are in Sirball's 'Chronicle of Scottish Poetry,' in Dr. Irving's 'Lives of the Scottish Poets,' and in Elia'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 'Fables,' edited by Dr. Irving in 1829, for the Bannatyne Club. For that club, in 1824, Mr. George Chalmers had edited the 'Testament of Creeseide,' and 'Rohin and Makynie.' Henryson writes with much greater purity and correctness than many of his contemporaries; his verison is good, and his poetical fancy rich and lively.

HEPATITIS. [LIVER, DISEASES OF, P. C.]

In many genus of Euphorbiaceae belonging to the natural order Umbelliferae and the tribe Paeoniaceae. The calyx consists of 5 minute teeth, the petals abscindate with an infixed point, the outer ones radiant. There are 34 species of this genus recorded, but only one on record in Great Britain, and few are applied to any useful purpose.

H. Sphekkidium, Cow Parfarn, has ternate pinnate leaves, the leaflets lobed or pinnatifid, cut, and serrated. The stem is about four feet high, the lower leaves 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 hedges of Great Britain. The whole plant affords wholesome nourishment for cattle, and is collected in Sussex for feeding 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 Kautehatabales and Roxians 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 sarchacetic 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 hibisberry. The seeds of the plant are diuretic and stomachic, and exude a poisonous oil.

H. pubescens has ternate leaves, somewhat pubescent beneath; the leaflets toothed and pinnatifid; the umbels of many rays; involucres from 1 to 2 leaves; the fruit elliptic, having the hairy exocarps. It is a native of Caucasus in mountainous places, and of the Caucasus in alpine places. The young shoots are filled with a sweet aromatic juice which is eaten by the natives of the Caucasus in a crude state.

H. Pyrexicum has large leaves, tomentose beneath; the leaflets lanceolate, toothed, or serrate; the involucres of few leaves; the young fruit covered with long hairs; the matured ones glabrous and nearly orbicular. It is a native of the Eastern and Central Pyrenees, and of Italy. Don thinks that this plant is identical with the H. gummiferum of Willdenow, which was supposed to yield the gum ammoniac of commerce. Don has however identified the plant which yields the gum, and has placed it in a new genus. [Doxeuma, P. C. S.]

All the species of Heracleum grow well in any soil, and are easily propagated by seeds or by dividing the root. (Common name and Botany: Bathington, Manual of British Botany.)

HERACLITUS, Roman emperor from A.D. 610 to 641. Since the publication of the volume of the Penny Cyclopaedia containing the life of this great emperor, the importance of Asia Minor and the adjacent countries as regards Europe has been much increased, and accordingly it appears useful to give more particular details of his campaigns from the point of view of the Persians, which are of equal interest for the historian, the geographer, and the soldier.

The destiny of the condition of the empire at the accession of Heraulitus compelled him to be an almost incoherent spectator of the minuscious 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 sildes of silk, and a thousand slaves, the Avars and the Persian king Chorosro or Chosroes to discontinue his invasions of Asia Minor and to be satisfied with the conquests he had made from the Greek empire, which comprehended Egypt, the country of Sardis, and the rich countries of the Black Sea, which were drawn from the northern borders of Syria to the eastern extremity of the province of Pontus. Heraulitus made a less humiliating peace with the Avars. Having got rid of his Persian conquerors, the Avars were not left alternately in the eastern and western provinces of the empire. The Tartar was a Tartar, and the Persian was a Persian. As in the case of the Tartar, so in the case of the Persian war, the Persians were always sparing 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 strategic operations of the greatest generals. 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. 610. History does not mention the army of the Persians, consisting chiefly of light infantry, in which the government was quartered in the environs of Constantinople, and afterwards in those of Chalcedon on the Asiatic shore of the Bosporus, and which were well prepared for a campaign. But Heraulitus was master of the sea, and his fleet was designed to enable him to choose his base of operation. Early in the spring of 622 he embarked his troops, and from the Bosporus he sailed to the eastern corner of Syria, which lies to the north of the island of Iskinderon (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 confidence of making the coming campaign of war, or of forcing them to re-embark, was turned, routed, and driven into the mountains of Armenia. Having thus cleared his way and secured his rear, Heraulitus marched through the Cilician gates northward in the direction of Mount Argeus (Argilea) and the Upper Halya (Ktitel Irmak), where, as it 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 town, which 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 troops to the coast of Asia Minor. It is important to note for conveying his army by sea to the south-eastern extremity of Asia Minor, and thence fighting his way through inaccessible mountains right across Asia Minor to the Euxine, if nothing else in his campaign was important. It is important to note for it seems that he could have gone there directly from Constantinople without incurring the risk of losing half his army, or perhaps the whole of it, in the defiles of the Taurus and Anti-Taurus. Our sources say nothing of his motives, but 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 Heraulitus 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 or voluntary retreat. And it becomes no less probable than probable that he was unable, to prevent the lay of Iskinderon from being the embarkation, 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 attacks 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 Upper Euphrates. In this case, however, his plan of campaign failed. The plan of his campaign further shows that it was corroborated by many subsequent wars, namely, that the inland tract between Trebizond and Issus is unfit for operations on a large scale, and that the coast of Asia Minor and the districts of Cilicia and Syria may be successfully invaded by an army coming from Asia Minor are the eastern extremities of Pontus and Cilicia, whence it is evident that a power which is master of the sea,
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. Caesar, therefore, prepared to march to Cilicia as his principal base of operation, and attacking Persia from the north, Heraclius further intended to compel his rival to withdraw his advanced troops from Syria and the or the chief fortified, and, with the Persians moving westward dominion, and thus to relieve his subjects and increase his means.

From Trebizond Heraclius carried the war, in the spring of 622, across Asia Minor into Phrygia. The Persians, we know, did not pursue him, and the Thebans 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 Charas (Kars) and thence in a direction parallel with the Araxes as far as the great head of that river, where, after a south-eastern and eastern course, it turns north-east. Thence he marched right upon Gazarra or Gaudzacs, which is the still common Armenian name of Tabris, and this city fell into his hands with all its wealth, Choroseres, with a very large part of its population. He then moved north, turned the Persian army and fell upon their rear, took and destroyed the Tchobars, now Urmischeh, near the western shore of the large lake of Urmischeh, which is said to be the birthplace of the sacred fire of the Persians, and the site of the battlefield of 626, where Heraclius had been victorious for its vast pastureages, for the support of his numerous cavalry, and for the purpose of having an easy communication with the Inhabitants of Asia Minor, and the Iron Gate, near Derbent, whenever they invaded Persia.

In the following year, 623, Heraclius penetrated into the heart of Media, took Cassin, and probably also Asphalt (Isapshin), defeated Chorores in a pitched battle, and, after having captured the Roman arms further 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 scanty, and the whole is so obscure that D'Anville gave up the idea of investigating it critically.

Meanwhile Chosroes 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 Sarbarra, to menace Asia Minor, while he himself prepared to move against the Caucasus. Sarbar was in Northern Mesopotamia; however, he did not take his way through the inland tract, which he could have done either in the direction of Dyjakebr, Maldeythe, Sivade, and Amasia, through the province of Sophene and the north-eastern part of Cappadocia, or in the direction of Marash and Kaisriseh 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 Rhodopean Mountains, and the Mediterranean, 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 Choresmes, he suddenly passed by, left the defence 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 Shihun, at a moment when Sarbar was in a very critical position, for although we do not know whether he entered Cilicia through the Syrian gates, or through the valley of the Pyrusmus or Jhith, it is evident that either one or both of these passes were already450 occupied by the Persians, while the Roman forces were scattered, and the defiles of the Cilician passes, which were defended by Roman troops. Theophanes says, that Heraclius approached from Germania (Marash) passed by Adana, and arrived in Cilicia before Sarbar, and as, when the battle began, the Romans were on the right and the Persians on the left bank of the Sarus, we may suppose that Sarbar came through the Syrian passes and found himself in presence of the main army of the Persians, but when he was going to attack the Cilician passes. In the following battle Heraclius annihilated both his own and his enemies' troops by his valour and the number of his warriors, and left nobody dared to fight. After a bloody conflict the Persians were routed; and Sarbar escaped, through the Spanish passes, with the scattered remnants of his army to Persia. Heraclius pursued him, but did not pursue him, and took his winter-quarters in Persia.

The next campaign of 625 equals the most splendid military operations in antiquity or modern time. In its grand outlines it may be compared to the operations of Hannibal and Scipio in a.c. 204, and to Napoleon's campaign in France in 1814: Hannibal was still in sight of Rome when Scipio boldly sailed to Africa; and the allies were fast advancing upon Paris, when Napoleon turned them and marched towards Germany: under similar circumstances Heraclius was more fortunate than either Hannibal or Napoleon, and it is only just to say, that he stood the fortune in the same light as the effect of his superior genius. Early in 626 Chorores opened the campaign with two armies against Heraclius, and a third under Sarbar, who was commissioned to attack a second army of Persians, stationed on the border of the whole peninsula, and reached the walls of Chaledon, opposite Constantinople; and, at the same time, a host of more than a hundred thousand Avars and other barbarians, under a new king, Ali, was approaching from the west, and twelve times assailed its walls. Choresmes hoped to induce Heraclius to hasten to the success of his capital, but the emperor stood firm at the foot of the Caucuses, dispatching however, by sea, twelve thousand armed horsemen that trampled safely at Constantinople. He knew that, however great the danger was for Constantinople, the Persians and Avars had no ships to effect a union, and that the inhabitants of the capital would fight to the last before they surrendered to an enemy whom it was more dangerous to encounter in the open field than in their assails within walls and towers. A Slavonian fleet having entered the Bosporus, destined to convey the Persians over to the European shore, the Greek galleys left the Golden Horn, and, in sight of the besiegers, destroyed the ships of the barbarians or took them and carried them off into the harbour of Costantinople. Shortly after this event the Avars withdrew and Constantinople was free, although Sarbar continued to amuse himself with the siege of Chaledon.

While this took place in the west, Theodore, the brother of Heraclius, defeated the Persian general Said, in Armenia, and the emperor defended with success the Caucasian provinces against the desperate attack of Choresmes, who took the field in company with the Avars, and defeated an army of 50,000 men near Tiflis. Another army of Khazars invaded Persia on the side of Turkestan. The united Romans and Khazars were 70,000 men, or perhaps more, since the Khazars alone were 50,000, and Heraclius led them forthwith into the province of Artaxiyatape, where he took up his winter quarters. He crowned the success of his arms by a stratagem which proved more advantageous than the winning of a battle. The king of the Khazars, and, by order of the Romans and the Khazars, Choresmes 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 his protracted absence irritated the king so much that he dispatched 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 his lieutenant, he added the names of four specious orders of the Persian king, and offered himself as the slayer of his master, whereupon he showed them the order, and declared the only way to save themselves was to break their allegiance to Choresmes and the Khazars and make peace with the emperor on their own account. The officers gave
HERBERT, JOHANN FRIEDRICH, a distinguished German philosopher, was born in 1770, at Oldenburg, where his father at the time held an office connected with the administration of the University. There is some reason to suppose that he was born from a man well 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. It is likely that Leibnitz's Monadology, as recommended by 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, and, although at first it appeared to him, in his opinion, to progress was slow, he was successful in every siege and engagement. He came from the province of Atropatene, passed the Zebas (Great Zebas) in its upper part, and marched towards Nisibis (Nimroud Misul), where he encountered the Persian army commanded by Rhazater, who had followed the emperor for some time, but gained some marches over him, and had taken a position near the ruins of Nisibis with the intention of preventing the Romans from occupying the valley of the Tigris and marching upon Ctesiphon. After an obstinate resistance from daybreak till night Rhazater was routed and killed, and Heracleius, who had again signified himself as a general and a warrior, pursued the fugitive enemy, and occupied the bridges over the Great and the Little Zebas, which the Persians had no time to secure. The battle at Nisibis was fought on the 12th of December, 627. On his way to Nisibis, he defeated the Persians at Arela, where he captured, plundered, destroyed the royal palaces of Issus, Begall, and others, and immense treasures fell into his hands. Soon afterwards he took Dastagerd, the favourite residence of Chosroes, and its treasures. The Persians fled to the desert of Theophrases given in thousands and many thousands of captives, chief inhabitants of Edessa and Alexandria, as also three hundred standards and other trophies taken from the Romans in former campaigns, captured by his victors. Chosroes fled from Dastagerd to Ctesiphon (El-Moalim), and thence into the interior of Persia. Heracleius was already in sight of the Zebas, when he suddenly retreated north-east upon Sizaura (Shiraz) and Gomorrah, crossing the Assyrian mountains in the midst of winter without loss. The motives of his retreat were either the fear of being unable to take the well fortified city of Ctesiphon, the winter, the want of provisions in Assyria, which had been ravaged, being already very sensibly felt, or perhaps the rebellion of Syria against his father Chosroes, whom he treacherously seized and put to death with eighteen of his sons, the brothers of Siroes. (February 23th, 628.) In the month of March following peace was concluded between Siroes and Heracleius. Siroes ceded Syria, Egypt, Mesopotamia, and Armenia, and gave back the Bosphorus to the Persians in his father's time. And Heracleius gave up many thousands Persian captives, and allowed the Persian soldiers who still occupied the principal towns of Egypt, Syria, and Mesopotamia to return to their homes as their subjects were treated in a humane manner through the Roman provinces. In the same year Heracleius had his triumphal entrance in Constantinople. Theophanes, so vague and obscure in his accounts of the first campaigns of Heracleius, gives a detailed and accurate description of the campaign of 627. It is not in the plan of this article to relate the particulars of the latter part of the reign of Heracleius, during which he lost all his conquests, which fell into the hands of the Arabs. A colossal statue of Heraclius existed at Barletta in Puglia so late as the end of the fifteenth century.

(Theophanes, p. 250, &c.; Nicephorus, p. 4, &c.; Cec- damon, vol. i. p. 276, &c.; Zonaras, vol. ii. p. 29, &c.; Gibbon, Decline and Fall; Lebègue, Histoire du Bas Empire; D'Anville, Recherches Géographiques concernant l'Expedition de l'Empereur Heracleius en Perse, in the Memoirs of the Académie des Inscriptions et Belles Lettres. The map of Asia Minor and part of Persia, in Kinneir's Journey through Asia Minor, Armenia, and Kurdistan, indicates the route taken by Heraclius in his campaigns, but there are not wanting some critical comments on the expeditions of Heraclius, 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.)
nations, such as the ideals of perfection, benevolence, malicelessness, justice, compensation, equity, and the like. In his metaphysics, Herbart points out three problems containing contradictions, viz., things with several attributes, change, and the like. He shows that these are contradictions, and to make the external and internal world agree and harmonize so as to become conceivable, he assumes that the quality of everything existing (das Seienden) is abstract. He draws an analogy between the objects referring to space and time, but they stand in relation to a something, which is the essence of things. Wherever this essence consists of a plurality of attributes, there must also be an abstract. We must therefore assume that many simple things or beings are the principles of all things in nature, and the latter, consequently, are nothing but aggregates of simple things. They exist by themselves in space as far as it is conceived by our intellect, but not in physical space, which contains only bodies. We do not know the real simple essence of things, but we may acquire a certain amount of knowledge concerning internal and external relations. When they accidentally meet in space they disturb one another, but at the same time strive to preserve themselves; and in this manner they manifest themselves as powers, although they neither are powers nor have powers. By means of these principles Herbart endeavored to reform the whole system of psychology which he found established by his predecessors; for, according to him, the soul too is a simple being, and as such it is and remains an abstract, and it is neither subject for speculation nor for experimental psychology.

There is nowhere any plurality of attributes, nor has it any power or faculty of receiving or producing anything; and the various faculties which are supposed to have been created by an act of consciousness, reason, &c., which sometimes are at war and sometimes in concord with each other, are, according to Herbart, mere fictions of philosophers. In like manner he denies that it possesses certain forms of thought or laws regulating our desires and actions. The soul as a simple being, and in its accidental association with others, is like the latter subject to disturbance and exerts itself for its own preservation. The latter determines the quality of every object, and he endeavours to deduce and calculate the whole life of the soul, with the aid of mathematics, from these mutual disturbances, checks, and from its reactions against them. Hence he is obliged to deny man's moral or transmortal freedom, although he allows him a certain free character. He maintains the immortality of the soul, because the simple principles of all things are eternal; but he denies the possibility of acquiring any knowledge whatever of the deity.


"Nearer Werke der Deutschen; Brockhaus, Conversations-Lexicon."  

HEREDITAMENT. (Chatez, P. C.; Descent, F. G.; Erat, E. F.; Heise, E. F.)  

HERESY. The word is the English form of the Greek ἡδηρεσία (airosis). It signifies literally a "choice," and hence it came to denote an opinion on any subject; and it was used to express a sect in philosophy. The word occurs in the New Testament, sometimes simply to denote a religious body, and sometimes as a term of reproach applied to the religious opinions of persons which differed from the opinion of him who used the term. When ecclesiastical councils determined what was the orthodox or Catholic faith, then Christians who would not acknowledge the decisions of such councils were called Heretics, and their guilt was expressed by the term Heresy: those who reject Christianity altogether are infidels and unbelievers.

The fifth title of the first book of the Code of Justinian contains penalties against Heretics, Manichæans, and Samaritans, which, in some cases, extended to death. Heretical books were ordered to be burnt. Before the Reformation in England heresy was defined as holding opinions contrary to the Catholic faith and the determination of Holy Church: at least this is the definition of heresy in the statute 2 Hen. IV. c. 15. The court in which a man could be convicted of heresy, according to this statute, was the court of the bishop in a provincial synod. After conviction the criminal was delivered up to the king to do what he pleased with him. If the criminal had adjured his heresy and then relapsed, the writ De Haeresiaco comiendo, upon which the criminal was burnt alive. One Sawtre, it is said, was the first man burnt alive for heresy in England, and the writ De Haeresiaco comiendo was formed in his case. But the statute 2 Hen. IV. c. 15, empowered the diocesan alone, without a synod, to commit a man for heretical opinions, and to imprison him as long as he chose, or fine him; or if he refused to adjure, or if he repeated the heresy, the sheriff, or other officer, who should be present, if required, with the ordinary or his commissary, when the sentence was pronounced, was to take the convict and burn him openly, without waiting for the king's writ.

It is unnecessary to mention the statutes of Henry VIII. relating to heresy. The Reformation was not fully established till the reign of Elizabeth. It appears from the statute 26 Eliz. c. 1, that the persons to whom the queen or her successors shall give authority to judge of heretics shall not declare any matters to be heresies except such as heretofore hath been adjured heresy by the authority of the canonical Scriptures, or by the first four general councils, or any of them, or by any other general council wherein the same was declared heresy by the express and plain words of the canonical Scriptures, or as shall hereafter be approved of by parliament with consent of the clergy in conviction. But there is no statute that determines what heresy is. After this statute of Elizabeth the proceedings in cases of heresy remained as they were at common law; for this statute repealed all former statutes about heresy, which was accordingly punished, after the Reformation was fully established, by ecclesiastical censures, and by burning alive a criminal who had been convicted, in the manner above described, in a provincial synod. The writ for burning the heretic could not be demanded as a matter of right, but was left to the discretion of the crown; and both Elizabeth and James the First, in their decrees, though they declared heretics to be burnt, said, burnt alive two Anabaptists, and James burnt alive two Armins.

The statute of 28 Charles II. c. 9, abolished the writ De Haeresiaco comiendo. Heresy is now left entirely to the ecclesiastical courts; and the punishment of death in consequence of any ecclesiastical censure was by that act abolished in England. As Elizabeth and James preserved, showed their approbation of burning heretics alive, so Lord Coke (3 Inst. c. 5) approves of the punishment.

At present the ecclesiastical courts punish for heresy, when they do punish, pro salute animae, as it is termed—that is, solely out of regard to the soul of the offender. But it is difficult to say at present what can be called heresy; and perhaps it is difficult to say what is exactly the punishment for it. It is remarked by the Report of the Committee of the House of Commons on Penalties and Disabilities in regard to Religious Opinions, 1845 (p. 22), that 'the jurisdiction, as it may affect the laity, and clergy not of the established church, or indeed as administered pro salute animae, appears to militate with the principles contained in modern acts of toleration, that are inconsistent with the infliction of punishments for mere opinions with respect to particular articles of faith or modes of worship.' Indeed there seems no risk in asserting that much of the jurisdiction of the ecclesiastical courts in respect to heresy, whether it shows itself in speaking, writing, or preaching, has been destroyed by the various Toleration Acts. The Criminal Law Amendment Act 1885, which abolished the jurisdiction of the ecclesiastical courts in matters of heresy, except so far as it may be directed, to prevent ministers of the Established Church from preaching in opposition to the Articles and doctrine of the establishment.
which they receive their encomiastics.' So far as this, there is certainly no objection. There ought to be some speedy mode of depriving a man of these encomiastics, which he accepts upon certain terms. He who will receive them [Franks, 9, 5] as a reward for doing what he is paid for teaching, deserves the reprobation of all mankind; and those who dislike ecclesiastical authority most could not be better pleased than to see such an offender hanged or quartered, or hanged, quartered, and burnt in any way that the rule of the church provides, to which the offender has solemnly submitted himself.

In the year 1866, proceedings were commenced in the Archdiocesan courts against the Rev. Mr. Oakley for writing, publishing, and maintaining doctrines contrary to the Articles of Religion.

The history of Heresy 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 [Blair, 4, F. C.]

HERMES, Gnomus, the founder of a philosophical school of Roman Catholic theology, was born on the 22nd of April, 1776, at Dreverwald, near Miinster in Westphalia, where he received his first education from the priest of the parish. He subsequently became a pupil at the gymnasium at Rheinau, and there gave the first proofs, especially in his mathematical lessons, of his strong mental powers. After the year 1797, when he entered the theological faculty at Miinster, he made up his mind to devote himself with great zeal to the study of the philosophy of Kant, and thus arrived at the conviction that one had better establish a perfect system of theology unless he was prepared to make the first steps in the direction of a new human knowledge. In 1798 he was appointed teacher at the gymnasium of Miinster, and his exertions henceforth were directed towards restoring, on a firm basis, that which had been demolished by Kant's 'Criticism of pure Reason.' But 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 1807, when he was appointed professor of theology at Miinster. 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-Vierchor, afterwards Archibishop of Cologne, and the ill feeling thus created had probably some influence in the subsequent proceedings against the doctrines and followers of Hermes. In 1810 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 the professor of the highest esteem both of his colleagues and pupils. He died at Bonn on the 26th of May, 1831.

The only work that Hermes published bears the title 'Philosophical system of the Church-Catholic founded in 1819, 8vo.' A second edition appeared in 1831. So long as the Archibishop Spiegel zum Doensberg was alive, Hermes and his views were not attacked by the see of Rome; but soon after the elevation of Droste-Vierchor to the archbishopric of Cologne, reports were made to Rome about the injudicious 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 denunciation against Hermes was in the first instance made by some German who was hostile to him, but it was taken up very eagerly at Rome by Pius VI. In his report to the pope on this remarkable point in Hermes's work was his principle, that reason or philosophy must in the first place prove the reality of a divine revelation, and in the second, the truth of the Roman Catholic system. These ideas being ascertainment, Hermes demanded absolute submission to revelation. He does not attempt philosophically to prove the truth of every particular dogma, but only to show that the Church has a right to establish her 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 there was the greatest abuses under him, that every theologian had 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 received by the German people was such that the execution produced a rupture between the courts of Berlin and Rome. The disciples of Hermes made all possible efforts to defend their master, and two of them, Professors Braun and Elvenich, refusing to make the submission to their constituents of Hermes. In the same year the professors Braun and Achterfeld of Bonn, who refused to recant their Hermesian opinions, were forbidden to lecture in the university by order of the archiepiscopal consolidator, 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 Erlenreich's 'Der Hermesianismus und sein Rieinischer Gegner Perronne,' Bonn, 1834, 8vo.

'Horsem,' more properly Ermolai, from the Greek ippom, signifying an inhabitant of a desert, is the name given to a race of men who retired from society without becoming members of any monastic community, and the institution between hermits and monks, and the origin of both, are explained in P. C. under the term 'Monachism' (437).

See also [Hermogenes, 10, 3, 4.]

HERMOGENES, a heretic of the early church, against whom Tertullian has written a treatise, was most probably a native of Africa, and polished, according to Bunsen and Le Clerc, A.D. 168. The chief 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 tendency to the Gnosticism of the Hermesians, and especially to those of the Stoics. He is accused of having taught that God made the world out of matter that was coeternal with him. 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 the eternity of the Creator; and he taught that the universe has 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. The dogmas of Hermogenes, though strongly resembling those of the Christians, are, no doubt, the most of the other great doctrines of religion, as is not charged by either Tertullian or Theodoret with any other heresy than that to which we have alluded. We have 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. xviii.; Tille- \lose, Hist. Eccl.; and Cave.

HERNANDIA'CÆSE, a natural order of incomplete Exogenous plants. It has monoeocous or hermaphrodite flowers, with an involucelle in the pistiliferous and hermaphrodite flowers. The flowers, which are violet, tube oblong, and possesses 5 to 7 with one and eye, is, the ovary is bilocular into the calyx in two rows, of which the outer is often sterile, with the anthers bursting longitudi- nally; the ovary superior, 5-celled, with a pendulous ovule only once. The leaf is entire, and peltate; the fruit is pendulous; the embryo is inverted, without albumen; the cotedyls somewhat lobed, shrivelled, and oily. The species are trees, which alternate entire leaves, and flowers arranged in axillary or terminal spikes or corynbe.

This order has been constituted by Blume. It contains only two genera, Hernandia and Incarpus. There are some species referred to Mc, and it appears that 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 Thymeleaceae, from which they differ only in their dra-
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peculiar fruit, lobed cotyledons, and the involucre to some 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 some 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.

Histerella is a tall erect tree, with coriaceous pellate leaves,

yellowish panicked flowers, a large inflated succulent 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

modern name from the fact that it has been cultivated

throughout its persistent involucres. The bark, the seed, and

the young leaves of this tree are slightly caustic. Rumphius

says that the fibrous roots chewed and applied to wounds

produced by the Macassar poison, act as an efficacious 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 light, and

Anstiet says that the wood of H. Gulenatns 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, Fvora Medica

Buckley, Bot. Mag. 1825.

Hesperis (from 'Hesperus,' the evening), a genus of

plants belonging to the natural order Cruciferae, and the tribe

Saponariae, as Felis is to Canis. The sweet fragrances of

the night, and hence the genus derives its name. The pods

are quadrangular, or sub-compressed, the valves keeled and

somewhat swerved, the seeds in a single row. There are only

three species, and several varieties, of this plant; the one

made use of by man but as ornamental and sweet-scented plants.

II. Matronalis, Dame's Violet, is the only British species;

it has an erect branched stem, ovate lanceolate leaves,

and large handsome lilac fragrant 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.

All these plants are to some extent noxious, and require the

same treatment as most other hardy garden-plants.

(Don, Gardner's Dictionary; Balsington, Manual.)

HETEROCERUS, a genus of pantropical coleopterous

insects established by Lesc. Latrellle places it in his

second section of his family Clanciorum, and forms it of a

tribe under the name of Aconiptopus, on account of the flat-

tened broad limbs armed with spines. These beetles have

small oval depressed bodies, and eleven jointed antennae

the last six articulations forming a cylindrical club. They

live in sand or mud, by streams or among marshes, burrowing

in the ground by means of their spinous tribe. When dis-

turbed, they wallow in the mud, and then live, like the

previous species, in the same situations with the perfect insects. Several

species are found in Britain.

Heteromera, the second section of Coleopterous insects

under the same family, comprising such as have three

five articulations in the first four tarsi, and four in the two

posterior. They are all vegetable feeders. Latreille divided

the Heteromera into four groups: 1st, the Malacoxa, dusky

or black insects, for the most part aquatic and having hard

elytra, which are often anachylos. Their jaws are furnished

with a hook, their claws are simple, and their eyes are oblong

and depressed, a character which indicates nocturnal habits.

They live in sand, or under stones, and often in cellars and

ruins. They are very tenacious of life, living many months

after being transfixed by a pin and placed in the cabinet.

Doubt exists whether these insects live in their bodies, which

much exceeds that found in allied insects, and whether they

enable them to subsist for a long period without food. They

are found in all parts of the world. The genera Pimelia, Diops,

and Tenebrion are types of many tribes among the Malacoxa.

The Diaps mortisia and the meal-worm, Tenebrion melitor,

are familiar British examples.

2nd. The Tachinies, insects without hooked jaws, with

more or less pubescent bodies, and legs adapted for running,

furnished with simple claws. They live under the bark of trees, or in the

fungi parasitical on their trunks. A few live on the ground under stones.

The genera Diops, Hippo, and Tenebrion are types of many tribes among the

Malacoxa. These insects are very injurious to crops.

3rd. The Stenolytra, which differ from the preceding in the structure

of the antennae, those organs being perforate or elevated in the Tachinies,

but simple among the insects of the present section. In other respects they are similar.

The genera Hyalus, Catopria, Omophora, Zonocerus, are types of tribes. They mostly inhabit wood. The

Dactyloa are found on flowers: they fly well.

4th. The Trachelixida, beetles having triangular or heart-shaped heads, are exclusively British, the geranium beetle

not retracted. Their bodies are soft, and furnished with wings, protected by flexible elytra. The jaws are not furni-

ished with hooks, and the claws are bifid. Lepria, Pyro-

chus, Microlepis, Horia, Lepus, etc., are genera of beetles in this division. In the tribe of Centharidn, of which

Meloe is the type, are found the blistering beetles, which were probably the insects known to the ancients under the

name of Dysidiae, and were used as a cure against the

變. This genus belongs to the natural order Scaritacceae, and consists of about

sixteen species. It has a permanent 5-cleft calyx with an imbricated stylet; undivided somewhat unequal petals;

5 stamens; 2 styles, very long, distinct, the length of the

stamens, eventually diverging; the capsule crowned by the

withered flower, at the lower part united to the calyx, 1-celled,

dehiscing between the styles. The species are herbs with leafless stems, radical leaves, and racemose or panellated flowers.

II. Americans, a genus of insects belonging to the natural

order Scaritacceae, has, in addition to the

following species, a large number of species, which

are parasitic on the sperms of plants,

and the whole plant pubescent; the leaves on long petioles, somewhat 5-lobed, toothed; the inflorascence elongated,

toothed; the bracteoles lanceolate the length of the calyx; the stamens usually

exserted. This plant is a native of North America, where it has

obtained, on account of its astringent properties, the name of Acanthus Root. The stamens are united in pairs, and

its astringent character is to be ascribed. The other

species contain tannin, but are not used for any purpose in

the arts or medicine.

(Don, Gardner's Dictionary; Lindley, Flora Medica.

HEXAPLA, the plural of Hexaplos, which means 'six fold,'

was an edition of the Scriptures of the Old Testament

prepared by Origen, which exhibited, in addition to the original

Greek text, a Hebrew version, at the same time giving the

seven new names for the Hebrew and Greek versions;

names of the Septuagint, that of Aquila, that of Symmachus,

that of Theodotion, one found at Jericho, and one found at

to the books of the Hebrew Scriptures.

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 Octataxia.

The Hexapla, which was prepared by Origen, was introduced for

the first time into the at the Milan Synod in the year 426,

and the work was now of great rarity, many fragments of the Hexapla had been

collected by Petrus Morinus Parisiensis, and inserted by

Flaminius Nobilis in his Greek Bible printed at Rome in

1687; and all that had been recovered were given by

Joannes Drausius in his 'Veterum Interpretum Graecorum

Fragmenta,' Anhime, 1622.

(See F. C. Aquila, ii. 206; Bible, i. 372; Septuagint,

xxi. 357; Symmachus, xxii. 445; Theodotion, xxi. 286.)

HEYWOOD, JOHN, one of our earliest dramatic writers, was

lived in the first half of the sixteenth century. He was prob-

ably a native of Lincoln, was educated at Lincoln and

possession of land at North Mins, in Berks, where he is regarded

as having made the acquaintance of his neighbour Sir Thomas

More. This lover of wit introduced him at the court of

Henry VIII., where his musical skill as a performer on the

viols, and his liveliness, both in society and in his writings,

gained him high favour. To Queen Mary he was further

recommended by his zealous attachment to the Roman

Catholic Church. In the time of Elizabeth, he was engaged

in 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 dra-

matic pieces stand between the miracle plays on the one hand, and the elaborated dramas on the other.

They may properly and strictly," says Mr. Collier, in his

'History of Dramatic Poetry,' 'be called Interludes—a spec.
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cles 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 Fyee, the Curate and Neybour Pratte,' was not, however, but was written before 1521. In Doddale's "Old Plays" will be found his 'Play called the Foure P.F., a new and a very merry Entertlude of a Palmer, a Pardoner, a Pottery, a Pedlar,' which is a fair specimen of the metrical arrangements and of the grotesque coarseness of his humour, and other productions bearing his name was a posthumous volume of 'Woorces,' 1578; 4to., which contains proverbs in verse, and six hundred epigrams, by which in his own time he was probably not best known. In respect of them, and to distinguish him from a later play-writer [HITWOOD, THOMAS, P.C.], he is not unfruitfully called 'The Epigrammatist.'

The genus of plants being a part of the natural order Compositae. The heads are many-flowered, the involucres imbricated with many oblong scales. Fruit terete, angular, and furrowed, 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-headed stem; diplocanecule or lanceolate leaves, hairy above, glabrous beneath. The flowers are of a pale lemon colour with a red streak on the back. It is found on dry banks and elevated places. H. alpinum has lanceolate leaves narrowed into a footstalk, entire or toothed; the involucre is covered with long silky hairs externally and suffused with a bright yellow colour. It is found on rocks in Great Britain. (Babington, Manual of British Botany.)

HEROCLOE, a genus of grasses belonging to the Phlox family, consists of species with leaves alternately arranged, 3-angled, 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 1 keel. The species of this genus, the H. berolina, has been found in Great Britain: it has an erect panicle, glabrous pedicles, and flowers without awns. The stem is about a foot high. It has only been found in Scotland. (Babington, 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 was not confined to the clergy, but included all classes. They were directed to visit, visit, reform, correct, and amend all errors, heresies, schisms, abuses, offences, contempt, and enormities whereby any ecclesiastical or any other authority whatsoever might be lawfully ordered or corrected. The commissioners, or any three of them, judged at their own discretion any speech or writing which tended to heresy or schism. All appeals to prior ecclesiastical jurisdictions were determined before the Court of High Commission. The court was empowered to punish incests, adulteries, fornications, and to inquire into matters relating to matrimonial offences. Other ecclesiastical courts had been subject since the Reformation to inhibitions 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 legal processes, by juries and witnesses, but to use all other means and ways which they could devise. This empowered them to resort to the rack, to torture, inquisition, and imprisonment, and to proceed, not upon information, 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 thereby criminate himself or his friends. Refusal to take 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 great object for which the court was established was more especially the propagation of the doctrine 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 she was resolved 'that no man should be suffered to hold a preaching 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 boldly 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, he established a Court of High Commission in Scotland, the authority of which was readily acknowledged by the bishops and some of the clergy.

In 1641, the Court of High Commission and the Star Chamber were both dissolved, and a clause was introduced into the act which prohibited the revival of the former court or any other of a like nature. James II., however, issued a new commission, and appointed seven commissioners to execute the powers and arrangements under the former courts, and with the full powers of the former courts. Serneoot, 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 COURT. — [Constable, P. C., p. 486.]
HIGH STEWARD. [Steward, Lord Hugh, P. C.]
HIGH TREASON. [Steward, P. C.; Law, Criminal. P. C. S.]
HIGHMORE, JOSEPH, a portrait and historical painter of some reputation in his day; was born in London in 1692. He was the nephew of Highmore, Surgeon-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 John Faber, and was afterwards a pupil of Sir Godfrey Kneller, and of Sir Peter Lely, and subsequently became a pupil of Sir Charles Dughet. He was for some time resident in Paris, and on his return to England lived in 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 Pine. Highmore was a man of much general information; he had a good knowledge of anatomy and was thoroughly acquainted with perspective. He used to attend Chesheden's lectures, and he made the drawings for his treatise on anatomy: we owe to him also one of the best 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, 1769. 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 Souls' 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, London, 1702; there is also 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 works are taken from the Scriptures. He died at Canterbury. He was married twice; he first 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 fowli plants from the Isle of Sheppey. (Bowerbank.)

HILLIARD, NICHOLAS, limner, painter, 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 limner by education, acquired painting by studying the works of Holbein, and he obtained great celebrity as a miniature painter. Dr. Prout, in his poem on the storm in which the Earl of Essex was surprised, returning from the island voyage, says—

Hand and hand of
By Hilliard drawn, a worth a history
By a worse painter made.

There are many miniatures, especially of ladies, by Hilliard extant. He painted Mary Queen of Scots 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 a large number of his works, and also of those of the Spanish Armada, and a curious jewel containing the portraits of Henry VII., Henry VIII., Edward VI., and Queen Mary; on the top was an enamelled representation of the battle of Bosworth, and on the reverse the red and white roses.

By hand of
By Hilliard drawn, A worth a history
By a worse painter made.
HILTON was the master of Isaac Oliver: he died in 1619, and was buried in St. Martin-in-the-Fields.

(Wallpole, Anecdotes of Painting, &c.)

In 1806, his son, Henry Hilton, abbot of Lincoln, was elected to the See of Lincoln on the 3rd of June, 1786. His father, who was a portrait painter and a native of Newark, died in 1822. Hilton was placed with J. R. Smith, the engraver, in London, in 1800; he obtained a scholarship by the Royal Academy as a student, and in 1808 he exhibited at the Academy — a picture of 'Buddhist, in a good style, and of extraordinary merit for so young a man.' In 1804 he exhibited his picture of 'Hilton receiving the Blessing,' which was generally well received, and praised in the 'Critical Review' and 'Procris.' These early works were followed by a series of noble compositions, in a superior style of execution and treatment, which greatly distinguished him from the majority of his other laborers. However, neither his subjects nor his style were popular, and he had the mortification to witness the success of very inferior artists, while his own works remained on his hands.

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 'Gannymede, which he presented to the Academy as his diploma piece. In 1822 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, 1839, in his fifty-fifth year.

Hilton died in possession of his best pictures — The Angel releasing St. Peter from Prison; Serena rescued by Sir Calepinus; Comus; the Murder of the Innocents, exhibited in 1822; the Death of Abel, exhibited in 1832; Una with the Lion entering Corecen's cave; and Rizaph holding the dead bodies of Saul's Sons (unfinished). Sir Calepinus rescuing Serena, exhibited in 1831, was purchased by the subscription for Hilton's 'excesses, for 500 guineas, and was presented to the National Gallery, where it now hangs, and 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 Corecen, exhibited in 1832, was purchased by R. Elison, Esq., and was engraved by W. H. Wett for the Art Union of London, and distributed among the subscribers of 1842. 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 Abraham's servant at the Well, exhibited in 1829; and Edith and the Monks searching for the body of Harold, exhibited in 1834. The following also appear to have been executed by the same hand — Hanging Bilibies, in the possession of Sir 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 James Phillips, Bart.; Cupid sitting on a Quiver, belonging to W. Smith, Esq.; Cupid and a Nymph, the property of J. II. Turner, Esq.; the Rape of Europa, painted for the late Earl of Egress, of which there is a print by Charles Heath; and the Infant Warrior — "This Hoppy Man is washing clothes; his infant warrior." (Secundus, exhibition in 1836.)

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, his own style, which appeared at a time when 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 taste in composition and design was refined and masterly. The figure of Sir Calepinus, in the National Gallery, is not a very good specimen of his style; it is exaggerated, and is not upon its feet. This is a peculiarity which occurs more than once in Hilton's work. But his figures sometimes show the falling out of his specific gravity. Those who knew him describe him as a man of much intelligence and great amiability. 'His manners were mild and graceful; his voice was at all times low, and his manner, even in conversation, mild and unassuming.' He died a widower, and childless.

HINCMAR was born in France in 806. He was of a noble family, and nearly related to Bernard, Count of Tou- lose. At a very early age he was placed under the care of the abbot of St. Denis, in Paris, and in 810, when he was seen to have 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 Louis the Moek, at whose court he frequently appeared; and whose court he was afterwards to frequent at the request of his orders. He must have had a high opinion of himself, for, in having under the displeasure of his royal master, he was banished from the court, and retired to Saxonzi, where he was accompanied by Hincmar. On the death of Hilton, his successor Lewis was a man of grave integrity, of great probity. He again introduced him to the court of the emperor, who presented him with the government of the abbots of Notre Dame at Compiegne and St. Germer. On this occasion he entered in 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 abbey, previous to accepting that prebend. In the year 845 was assembled the first council of Beauvais, consisting of ten bishops of the provinces of Rhinns and Sens. In that council the deposition of Ebbonius, archbishop of Rhoins, was confirmed, and Hincmar was elected by the clergy and people to succeed him. The following year, the council of Sens, under the presidency of Hincmar and the primate of Sens and Bourges, in which the powers of the metropolitan bishops were more clearly defined and extended.

About this period Godescalclus, a native of Germany, and monk of Orbais in France, attracted popular notoriety by a new exposition of the doctrines of St. Augustine on predestination. His peculiar views on this abstruse subject were prominently 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 Godescalclus 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 case, and to leave the judgment to be pronounced upon him to Hincmar, in whose province was situated the monastery of Orbais. The peculiar opinions of this imprudent monk, magnified by the hostile interpretation of them which Raban brought to Hincmar, had been brought forward to him from one who had already begun to rule the church with an iron hand. Hincmar caused him to be accused before thirteen bishops at the council of Quiercy, where he was declared an incorrigible heretic, and deposed from the ecclesiastical functions to which, it appears, he had been irregularly admitted. This punishment, however, was not sufficient to appease the rancour of his judges; the bold enunciation of his tenets was construed into contempt, 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 852 Hincmar embellished and enlarged the church of St. Benoist, and caused several works 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 to be void, the sole exception of Beau-

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subject of Predestination, which has been preserved. The arguments in it are chiefly directed against the opinions of the learned John Scotus Eriugena, whom he accuses of error respecting the Trinity and its presence 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 body consists only in remorse of conscience caused by the remembrance of sins.

In the year 862 we find Hincmar engaged in controversy with the pope, Nicholas I., one of the most learned ecclesiastics of his time. The occasion of this controversy was the assumption of power by Rothadis, bishop of Soissons, who 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. Rothadis, refusing to re-admit this priest, was condemned in two councils held at Soissons, excommunicated, and afterwards deposed and imprisoned. On an appeal of Rothadis 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 decree of the council of Soissons. Nicholas, irritated at the opposition of Hincmar, rescinded the decisions of that council, and demanded the libration of Rothadis, in order that he might hold a session at Rome in justification of his appeal. This demand was at first resisted by Hincmar, but, through the interference of the king, Rothadis was released, and deputies were finally sent by Hincmar to the pope to state the case of the bishop. This truce was soon followed by one more important; Rothadis was restored to the episcopal dignity, and he returned to his diocese accompanied by a legate of the pope. The pretensions of Rome to this effect are more fundamentally based on the Ancient Pontiffs, a work probably composed by Isidore Mercator, but claiming much greater antiquity. Hincmar, though the most learned pontiff of the age, does not appear to have disputed the authenticity of these documents.

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 favour 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 II. had in mind that he is not at the same time king and bishop, and so he did not dare to undertake the conduct of the church, which was their concern, not the state, which is the heritage of kings. The opposition was successful, and Charles the Bald and Hincmar together, took possession of the throne of Lorraine, and the pope, who had set on foot these operations, was left to bear the consequences of his attempt.

In the year 871 Hincmar proroged 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 Lonnep, nephew of the archbishop of Rheims. He was accused of spoliation of church revenues, of usurpation of powers not properly belonging to a bishop [INTERDICTION, P.C.J.], and of revolt against his sovereign. His uncle appears to have conducted the trial with severity impartially, and, as he was no bishop, he was dismissed from degrading from his ecclesiastical office.

About ten years after these events Hincmar exercised the same firmness in defending the rights of the church against the interference of the secular authority. It is not surprising that he had shown no disposition to parent or dispose of the claims of the Roman pontiff. Lewis III. wished to bestow the bishopric of Beauvais upon Odacer, a favourite courtier, who had been rejected as unworthy of the office by the ecclesiastical authority, and he endeavoured, by application 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 pope pressed him to resign, and he finally renounced the ecclesiastical charge of the see of his country; he had taken to the 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; but I must return to the charge, that it is my religious duty and my profession 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.' (Hincm. epist. c. 871, p. 188.) He prudently renounced in remorse of conscience caused by the remembrance of sins.

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 were pillaged and destroyed. They were advancing towards Rheims, when notice of their approach was given to Hincmar, who was obliged to leave the city by night, having previously taken the precaution to secure the treasures of the church, and the relics of St. Remy. The aged prelate arrived at Epernay, worn down by fatigue and anxiety. Severe illness compelled him to remain in that town, where, on the 21st of December, 877, he died. The death of Hincmar has been associated with the darkest period of ecclesiastical history, will ever be conspicuous as that of one of the most zealous defenders of the liberties of the church. His firmness and integrity in his views, 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 that the excommunication, of his bishops, are a sufficient index of his fearless spirit. 'Si excommunicatus venit, excommunicatus abit,' if he comes to excommunicate, he will return excommunicated.'

The following is a summary of the article, 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 superstitions 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 Nice;' and 6th, 'On the Nature and Sanity of Oaths;' besides several letters and 'Capitalaria.' His works have been collected in two volumes by the learned Simmond, Paris, 1645, and another volume was added to this collection by Canisius, Leipsic, 1669.

The following are his principal writings which have been consulted, and may be referred to for a fuller detail of his life: Fleury, M. de Molaise, and Waddington's Ecclesiastical History. Lect. IV. of Waddington's History of the Church of France. Mâssard, Hist. de France, vol. ii.; Mallet, Hist. de France, vol. ii.; and Guizot's Sixth Lecture on Modern Civilization.

HINDOO ARCHITECTURE. [Hindustan, 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 commoner kinds the section is that of a hollow cylinder working round a fixed central pin. Without pretending to describe or illustrate these various forms, it may be stated that few of the more important deviations from the ordinary form, referring to Hebert's 'Engineer's and Mechanic's Encyclopaedia' for fuller details. In Collingue's patent hinges, which are peculiar because the principal rubbing is at the principal rubbing 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 piece of lead or paste, to prevent its rattling. The hinge, which is pin, another celebrated manufacturer, who has displayed his ingenuity especially in designing hinges for unusual and apparently insuperable situations, in rendering their ornamental and effectual. There exists a hinge for doors that will prevent disfigurement, and for contriving invisible hinges for situations in which it is desirable to conceal the hinges altogether, is the inventor of the sliding hinge 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 two, 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 acquired the character of the door. These portions 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 into 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 a little from the floor by the sliding upon one another of the inclined surfaces of the leaves. In this, as they are 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 hollow 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 shut. By this arrangement the door retains its disposition even when the door is kept open to a great extent, which is as much movement as is usual upon a person entering or leaving the room, but will stand open if opened or beyond 90°, although even then a very slight push is sufficient to shut it. When the door is kept open in a small spring is attached to hinges of this description, to aid the closing of the door when it has been opened but a little way. In connection with such spring hinges, small spring plates are used for the doors of public offices, when it is desired to render the closing of the door both certain and quick. For such doors, hinges which 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, the catch being readily serviceable 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 too 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 positions of the apparatus are varied at pleasure: the action of the hinges is all the contrary to the common kind of hinge; a style or post near to which it is placed, and at the same moment to complete its hinge-like connection with the opposite style. Notwithstanding the singularity of this action, the device is so simple and so entirely obvious in its import, and capable of turning upon its hinges with greater facility than one hand in the common way; and it cannot be understood without examination, but requiring the attention of the user. 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 worthy of notice, which is also described and represented by Hebert, is Nettledoff's hinge for the doors of book-cases, by which two adjacent doors opening in contrary directions may be hung without an intervening step: the two doors being divided together by a hinge 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 volumes which happen 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.

HIPPOPHAE (from Πηγος a horse, and φωσ, food), a genus of plants belonging to the natural order Leguminosea. It has the limb of the calyx 5-parted with linear segments; the tube of the corolla long, straight, entire; with the limb 5-parted nearly of the same length as the tube; the petals and calyx more or less monadelphous and symgenous; the stigma stellate, the capsule 2-celled, 2-valved, many-seeded. H. longiflora is an herbaceous plant, with short axillary pedicels, mucronate or coarse 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 poisonous of plants. If the juice only accidentally touches the lips or eyes it produces a burning inflammation. Horses are violently purged after eating it.

(Hon. Gardener's Dictionary; Lindley, Flora Medica.)

HIPPOCREPIS (from Πηγος a horse, and σπειρινος, a wheel, on account of the curved shape of its pods), a genus of plants belonging to the natural order Leguminosea, the tribe Hedy- sareae. It has diadelphous stamens, a piliferous scotic style; the legume curved, with numerous 1-seeded joints; the seeds cylindrical or compressed, obtog, 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 seetle, but usually disposed in umbels on the tops of the axillary peduncles. H. Eulaleocentron, a shrub from Minorca, 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, which may be kept in a flower pot and brought into the house in winter. It grows well in a soft composed of loam and peat; and cuttings strike readily under a hand-glass.

H. comosa, which grows in Italy, has umbels unumbel- late, their joints rough, 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 Austria, and in

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 are propagated by dividing the roots. The annual species should be grown from seeds, which may be sown early in spring.

Hon. Gardener's Dictionary; Babington, Manual of Brit- ish Botany.)

HIPPOPHAE, a genus of plants belonging to the natural order Leguminosea. It has discolored flowers with ovate sepals. The staminal flowers have a perianth of two leaves adhering by their points; the stamens have four very short filaments; the pistilliferous flowers have the perigonium tubular and cloven at the summit; the style is short, the stigma elongated; the nut 1-seeded, clothed with the large covered berry-like fruit. The fruits are sweet and

The only species of this genus is the H. rhamnoides, which is a small shrub found on the east and southeast coasts of Great Britain, and other parts of Europe. The said berries yielded by this plant are often eaten as a fruit, and are in this

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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 open into the Pacific Ocean. The Gulf of Bothnia contains the Gulf of Bothnia est them with their fish.


Babington, Henry, ALOYSIUS, was born at Alcobi near Donnrueschleir, Baden, June 27, 1759. 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 1790 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 disquisitions 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- kunst nach den Grundstimm der Alten, 1821-7, 8 vols. 4to., with a folio atlas of plates. This last not only gives a history of ancient architecture, that of Egypt included, down to the time of the Renaissance, but also a full account of all the various classes of buildings. Letterly he was much occupied in arranging the collections in the Berlin Museum, which brought him into a literary dispute with his former pupil and competitor, who was to have visited the country and made remarks on English art. Hirt died at Berlin June 29, 1837, just two days after entering his seventy-eighth year.

Hoadley, Benjamin, M.D., eldest son of Bishop Hoadley [HOADELY, B. BAXAND, P. C.], was born February 10, 1765, in London. He was admitted of Corpus Christi College, Cambridge, April 8, 1782, and received his degree of M.D. in 1792. In 1789, he was appointed physician to his Majesty's household, and in January, 1790, was appointed physician to the household of Frederick, Prince of Wales, and he held both offices at the same time. He was the author of 'Three Letters on the Organs of Respiration,' read before the Academy of Physicianians in London, 1785, and the Gulstonian Lectures for that year; 'Oratio Anniversaria in Theatro Col. Medico, ex Harvoi instituta, habita die 18o Nov. 1742,' and the Observations on a Series of Elec- tric Phenomena, 1756, 4to. He was also the earliest of the family to be distinguished for his performance of the character of Ranger, in the dramatic pieces. Dr. Hoadley died August 10, 1757, in his house at Chelsea. His brother, the Rev. John Hoadley, L.L.D., born October 8, 1771, died May 17, 1810, was also with the family.

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The Yellow Sea, or that part of the Yellow Sea, which lies south of a line drawn from the most north-east corner of the Gulf of Shan-tong to the coast of Corea at the back of James Hall's Island, is at its southern extremity the mouth of the river. The Yellow Sea has the south-west coast of Corea nearly seventy 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 of

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the Hoang-hai are high and rocky, with the exception of a tract of about sixty miles contiguous to the mouth of the Hoang-ho on the north, where the country consists of alluvium. In the west, the valley of the Hoang-ho would be again left on high ground advance to the coast, and in this part some harbours of considerable extent are said to exist, but they have not yet been visited by Europeans. The navigation along the coast of Corea is said to be so far, at least, as the mouth of the Hoang-ho and Yang-tse-kiang the sea is full of shallows and sandbanks. On the opposite side, the coasts of Corea, the sea to the distance of fifty or sixty miles from the coast is said to be very shallow, and 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 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 point. Accordingly the number of junks which are not only employed in the inland fisheries, but also transport between the great eastern and western settlements, and sometimes excites the surprise of European navigators; but as the coast of Corea these vessels are rarely met with.

HODGES, men., the Family of Corea, in the Life of Lord Dartmouth. In 1776, he made a visit to China, and produced a series of his letters to the Royal Society; and also a Letter on his Voyage to the Yellow Sea; and his ital Hall, Account of a Voyage of Discovery to the West Coast of Corea, etc.

HOARE, WILLIAM, R.A., an historical and portrait painter, born at Bath about the year 1706. He studied at Rome nine years, where he was the fellow pupil of Pompeo Batoni, under Francesco Penni, called D’Imperio. Upon his return to England he established himself at his native place, where he acquired a great reputation as a portrait painter in oils and engravings; he painted also some historical pieces. There is an all-slate piece by Hoare, of Christ bearing the Cross, in the church of St. Michael at Bath; and another of the Lane Man healed at the Pool of Bethesda, in the Octagon Chapel, for which he received 100L. and a pew in the chapel. He was one of the original members of the Royal Academy, and sent several works to its early exhibitions. He died at Bath in 1792.

HOARE, PRINCE, who succeeded Boswell as foreign secretary to the state, and was the eldest son of William Hoare: he was professionally a painter, and is known as the author of about twenty dramatic pieces, among which are—No Song nor Supper; ‘Lock and Key’; My Countryman; and an opus major, entitled As a man, 1806, ‘An Inquiry into the requisite cultivation and present state of the Arts of Design in England,’ 8vo. p. 270.

Prince Hoare presented the so-called ‘Slaughter of the Innocents’ to the Foundling Hospital, which institution has lent it to the National Gallery; it is however only a part of a composition, and has been so completely punished and vandalized over, that if originally by Raphael, now at least nothing whatever of Raphael remains but the composition, which is brutal and without expression. Prince Hoare died at Brighton in 1834, aged eighty.

HOARE, SIR RICHARD COLD, Baronet, the artist of Wiltsihi, and an eminent biographer and antiquary, was born the 9th of December, 1758, and died the 19th of May, 1836. His father, the first baronet, was married to Anne, second daughter of Henry Hoare, Esq., and of Susanna, daughter and heiress of Stephen Colt, Esq. In a very pleasing autobiography which Sir R. C. Hoare drew up in his old age, he says:—‘In my youth I was initiated in the business of our family bank (Hoares’ bank, Fleet-street, London), till my grand father removed me from it, and gave me to use during his life-time all his landed property. An early habit of painting led me to purchase, at the age of seventeen, a pen and pencil; for, without some amusement, life ultimately must produce tedium and ennui; and, thanks to Providence, I used in my advanced age to feel the benefit of the magistracy of this island which my eldest daughter of Lord Latymer, who died in 1785, leaving one child, Henry. In 1787 he succeeded to the baronetcy. After the death of his wife he made an extensive tour on the continent, which occupied him nearly two years; and in 1788 he was commissioned to return until August, 1791. He devoted ample time to the drawing of interesting objects, and filled his portfolio with valuable drawings. For the gratification of his family and friends he printed the results of his travels, in two volumes, 8vo., under the title of ‘A Classical Tour through Italy and Sicily; tending to illustrate some districts which have not been described by Mr. Horace in his Classical Tour.’ When the greater part of the Continent had become closed in consequence of the war, Sir Richard travelled through his own country, and he began with Wales; but, as travelling without a parsnip becomes tedious, I believe, he says, ‘to take Giraldus as my guide.’ In 1806 he published a translation of Giraldus, with views, annotations, and a life of Giraldus, in two splendid quarto volumes. He furnished the drawings for the description of Monmouthshire by Archi- descon Cox. In 1807 he visited Ireland, and published a short account of his excursion. But he is as the historian of Wiltsihi, his native county, that Sir R. C. Hoare’s fame as a topographer and antiquary is best esteemed.

The first volume of South Wiltsihi is confined to British antiquities, and includes Stonehenge. The second volume consists of communications with North Wiltsihi, and includes a visit to the British Museum, and an account of Avebury. Part II. comprises the Roman Period. These two elaborate volumes were followed in 1821 by the History of Modern Wiltsihi, in six volumes, 8vo., of which a fourth edition was issued, in 1843. The first edition was dedicated to a nobleman who had a coachman for each, but the difficulty of obtaining aid of this kind at length compelled him to confine his attention to South Wiltsihi. A catalogue of works printed for private circulation by Sir R. C. Hoare is given in the ‘Gentleman’s Magazine’ for July, 1838, which also contains a list of his communications to the Royal Society of Antiquaries.

HODGES, WILLIAM, R.A., was born in London about the second week of January 1744; his father was a blacksmith, and kept a shop in St. James’s Market. He attended Shipley’s drawing school when very young, and became afterwards the pupil of Wiltsihi the landscape painter. He painted decorations for theatres, landscapes, and architectural views; among the latter, a view of the interior of the Pantheon, Oxford Street, which was burnt down on January 14, 1792.

In 1778 Hodges accompanied Captain Cook as draughtman 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 some six years, 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 1795. In 1795, finding that his Indian fortune was not increasing, he settled at Dartmouth in Devonshire, which however broke two years afterwards in consequence of the devastations of the French in Newfoundland. The short time spent on the decks of the Victory, under the command of Lord Nelson, 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 imitated Wilson, but with little success; his best works are—a view of Windsor from the great park, and three or four views printed in India. He painted also two or three historical pieces for Boydell’s Shakespears. His last works were two ordinary landscape paintings illustrating the effects of peace and war, which he exhibited with twenty-three others, one of which was a large view of Falconet’s equestrian statue of Peter the Great at St. Petersburg, in Old Bond Street; one was a seaport in prosperity, the other was the same view devastated by fire and sword. He closed the exhibition in disgust at the little attention which it attracted; sold his pictures by auction, gave up painting, and, as already mentioned, turned banker. These two pictures, returned to the dust, were re-graved, are now in Sir John Soane’s museum. 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, and published also an account of his Travels in India, with plates.

(Edwards, Anecdotes of Painting, etc.; Literary Gazette.)

HOENE, referred to in F. C., from Hume, p. 357, is a native of Brunswick, and is said to have claimed that the bridge of Osnabriick which Prince Henry of Prussia’s battery was built on was TRAVERSING, P.C.}
HOERBERG, PEHR, a distinguished Swedish painter, was born in a village of Sniaaland, in 1746; his father was a private soldier and extremely poor. Hoerberg's youth was spent in getting along by various means, at one time as a servant's laborer; and like Giotto's, his first efforts were made with sticks and chalk in the woods when performing his pastoral duties. When only fourteen years of age he entered the service of a painter, and was told that he would never become one as a very short time in his life. However, by the time he was twenty 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 also as a wandering artist, and he even ventured to take a wife. In 1784, in his thirty-eighth year, he became a student in the Royal Academy of Arts at Stockholm, in which he obtained two prizes, and made rapid progress. In 1790 he established himself in Copenhagen, and in 1805 he obtained a great reputation, and in 1797 he was elected a member of the Swedish academy, and was appointed historical painter to the king. He died in 1816.

There are eighty-seven altar-pieces by Hoerberg in Sweden, five of which are copies; his paintings altogether amount to about 700, mostly religious pieces; his drawings are likewise numerous, and he executed many engravings.

His execution is unfinished, but his compositions are vigorous and perspicuous; and his figures are more distinguished for character than for beauty.

His autobiography was published at Upsala in 1817; it has been translated into Swedish, Danish, and the original MS. is in the library of the Gymnasion of Linköping.

(Kunstdbatt, 1922; Nagler, Allgemeine Kunstler Lexicon.)

HOLASTE, a genius of fossil Echinodermata, from the chalk and limestone of the Tertiary period.

HOLCUS, a genus of grasses belonging to the tribe Ses-}

loreicoe. It has 2-flowered glumes, the lower perfectly awn-

less, the upper usually staminiforous, with a dorsal awn; the}

palea hanging on the fructiferous glume. There are two British species of this genus. H. lanatus has the upper glume obtuse, acuminate; the awn smooth, except for a short distance from the tip. It grows in meadows and pastures. H. mollis has the upper glume acute, and the awn rough throughout its whole extent. It grows in thickets or open places on a light soil. The H. cernus of Wildenow, and the H. sorghum of Linnaeus are now referred to the genus Sorghum. [Sorog-}

num, P. C. Fras refers the species of Theophrastus (Hist.-}

Pl. vii, 1, 8, 7, 10) to these grasses, and not to the Setaria}

Italica, as had been done before by previous authors.

(Background, Manual of British Botany; Fras, Synopsis}

Plant. Florence Clas.)

HOLL, ELIAS, a distinguished German architect, was}

born at Augsburg in 1573. His father, Johann Holl, was a}

 Likewise an architect, and was much employed by the cele-

brate grand-ducal family of the Palatine principality, and was taken to young to Venice, by a rich merchant of the name of Garb; and he there studied the Italian architecture, which style he adopted for all his buildings at Augsburg, though much modified in parts, in accordance with the local arts. He added a great portion of his public buildings, but his masterpiece is the Rathhaus, or town-hall, built 1615-20, which, though not among the largest, is still one of the best executed in Europe. The facade is 147 feet wide, its depth is 110 feet, and in the centre 152 feet high; there is a print of it by Solomon Kleiner. Holl built also several churches, and the castle or palace of Schönfeld, and the palace of Willibaldsburg at Eichstätt. He died in 1636, aged sixty-three.

(Von Stetten, Erkärten und der in Körper getrockneten}

Vorlesungen aus der Geschichte der Reichsstadt Augsburg,}

etc., 1865.)

HOLLAND, SIR NATHANIEL, historical, landscape, and}

portrait painter, was the third son of Dan, the architect of}

the Mansion House, who died in 1768, and the younger brother of Nathaniel and R.A., the architect and painter.

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 was not born at any 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 a fortune in 1800, having previously resided at Dummer, who was connected with several noble families. This lady was possessed of entail estates, chiefly in Hampshire, including Netley Abbey on the Southampton river, to the value of 19,000l. per annum. Upon his acquisition of his title, Sir Nathaniel Holland appears to have resigned his academical diploma, for from that time he exhibited as an honourable exhibitor. He represented for some time the property of the Holland House, near Winchester, and he died suddenly in that city on October 15, 1811, aged about sixty-eight. Lady Holland survived until 1825, when she died, leaving personal property to the amount of 15,000l. She came to her nephew the late Earl of Cardigan, who was her sole executor and residuary legatee. A story was circulated about Sir Nathaniel Holland, that when he became possessed of his great fortune he repurchased for him that he spent thousands in the repurchase of his own works, for the purpose of destroying them to obliteriate the recollec-

tions of his ever having been an artist. This story, how-

ever, independent of the veracity of the reports received from some of his friends, is contradicted also by the facts 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 own 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 and Sir W. Wyne contributed three to the exhibition of the works of Sir Nathaniel Holland, at the British academy in 1817—Orpheus, and Garrick as Richard III.; two of his very best works; and Charles, Earl Camden, Lord Chancelor. The following are also among his best works:

The Portrait of the Duke of York; The Group of the General 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 peers, and latterly to some landscapes; for the last work which he exhibited was 'A View in the New Forest.'

It has also been reported that Sir Nathaniel saved 200,000f. out of his wife's income, and bequeathed it to his relatives, but this report is contradicted by the fact that he distributed only 30,000f. among his relations, the residue was bequeathed to his widow.

These reports have here noticed, more particularly because they have been carelessly repeated and with considerable asperity by the writer of the Article on GIANE Dance in this work. [P. C. S.] They appeared in the ' Gentleman's Magazine' for 1811, and in part, in 1825, but have been con-

tradicted in subsequent editions of Pilling; and upon their insertion in 1834 in the 'Somerset House Gazette,' they were immediately afterwards contradicted in that same work, and an apology was made for their appearance. The statements of the 'Gentleman's Magazine' were apparently not seen by any of Sir Nathaniel's family, or that work would have certain-

ly contradicted them also.

(Somerset House Gazette, 1824; Gentleman's Magazine, 111, 1811; An Account of all the Paintings that were in the Rooms of the Trustees, belonging to the House of Commons, from 1813 to 1829.)

HOLLAND, HENRY, holds a high rank among the architects of his own time, and was greatly patronised by George IV. when Prince of Wales. But we have no right to think that by Holland himself, the only instance of such classical decoration among the whole of our modern classical porticoes— but even the very bases of the columns were enriched with carving, a species of decoration never before known in England, being so near the eye, it challenged direct and minute observation. Being only hexastyle—and there was not at any time such an instance of an octastyle in the metropolis—it did not make so far reaching an impression. This is peculiar in its proportions, which so many later examples do; yet it excelled all before or since in its bold projection from the building, which rendered it of the highest proportions in that respect, although unfortunately, its rapidity of execution diminished it. The orders are carried on each flank, in order to obtain an interval sufficiently wide to admit carriages. The depth and consequently the effect of the portico was still further increased by its being also recessed within the building, by which it was rendered very-

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nearly a square in plan, the depth being almost equal to the breadth. The Ionic colonnade seen 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 conclusive argument against it, that the column supported not one but two stories, and that the lower part of its entablature, and the entablature was requisite for connecting together the two gateways; therefore had there not been thus two stories, there 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 actual representations of the building, the entrance at the first towards them, the entrances to the Public Buildings of London being both too few and upon too small a scale to serve much purpose, 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, luckily 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, Whitbourn (built by Paine), adding to it the elliptical entrance-hall, on what was originally the west front. This, which was afterwards called Melbourne House and is now Dover House, would have been in every respect a far worthier and more interesting subject for the Vitruvian school than the Dutch mansion is, as is apparent from the comparison. In it, the edifice made scarcely any pretensions to architecture externally. He was the architect of another building in the metropolis, of considerable architectural distinction, the India House, Leadenhall Street, the cost of which has, rather strangely, been generally given to Richard Jupp, who was only the Company's surveyor, and the conductor of the works, the design, and consequently the architecture, belonging to Holland. And the design is in some respects unusually florid in character, the science of the portico (a recessed Ionic hexastyle loggia) being highly enriched, like that of Carlton House, the pediment filled in with sculpture, and its architrave surmounted by a screen. The architrave, the rest of the façade however is by much too plain and unpretentious to accord with such degree of embellishment confined to the centre of it, and the rustication of the ground-floor augments, instead of diminishing the effect of the edifice. The difference between the façades of Carlton House and Dover House. The entablature of the portico is suppressed elsewhere, the cornice alone being continued along the rest of the front, for which there is some reason, since otherwise the cornices of the windows would have joined the architrave. England's other work was alterations in the mansion built by Brown [Browns, P. C. S.] at Claremont, and added the colonnade screen wings to the Assembly Rooms at Glasgow.

He died at his house in Hans Place, Sloane Street, Chelsea, on 9th June, 1785, at the age of seventy-three, and therefore he lived 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 magnanimity and public spirit, as well as for his great wealth, having, in 1705, at the age of seventy-six, married a second wife, Christian, daughter of the Rev. Charles Hope of Naseby in Lincolnshire, had by her, besides a daughter, two sons, Stephen, who succeeded his grandfather, dying early in his nine. Stephen became Earl of Ilchester; and Henry, who figures in our political history as the rival of the first Pitt, was, in 1765, raised to the peerage as Baron Holland, of Foulney, in the county of Wilts, his lady having the year before been made Baroness Holland, of Holland, in the county of Lincoln. Both baronies passed to their 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 celebrated orator and statesman.

The subject of the last reign were born at Winterlow House, in Wiltz, 21st November, 1773. On the 9th of January, 1774, that mansion, a splendid building, was destroyed by fire, in which the young lord lost his fortune, he had incurred 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 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 being saved 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. Frere, the present Lord Carlisle, and other persons who subsequently rose to distinction, were among the companions of his youth. In October, 1790, he was entered as a gentleman at Christ's Church, Oxford; but all that is told of his academic career is that he took the honorary degree of master of arts, in right of his rank, in June, 1791.

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 Carlisle, the residence of his cousin, the Earl of Derwentwater. He is stated to have been present when Louis XVI. accepted the constitution (as revised), after being brought back from Varennes, which was on the 18th of September, 1791. In March, 1795, he went abroad a second time, and, France being now closed, directed his course to Spain, over a great part of which country he travelled, studying the language and literature, and making himself acquainted with the character and manners of the people. From Spain he proceeded to Italy; and there, at Florence, in the beginning of the year 1795, 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 6000l. 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 place in the House of Lords. His first speech was made 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 the close, in what is described as having been a very animated and successful exertion of the Younger Grenville. He united in a high degree 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 personal. 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 began also on this occasion a speech in 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 was one of the very few exceptions that occurred for the constitutional information they contain, 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 all this time one of the chiefest 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 50th of April) he had moved that the House of Lords appeal to the British people, and he was considered by a Committee of the 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 Dreden 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 1802, after the conclusion of the Peace of Amiens, he repaired, with Lady Holland, to Paris, and was there soon after joined by Mr. Fox, along with whom he was introduced to the first council. From Paris, Lord and Lady Holland proceeded thenceforth to Brussels, and then to London, in that conveGENCY till after the breaking out of the war with England in January, 1805, returning home through Portugal by means of passports obtained through the Prince Regent, who had been in attendance in the House of Lords; and his name, as before, appears frequently in the reports.

He was not admitted to office during the ministry of Mr. Fox and Lord Grenville (January, 1806); but on the 28th 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. Pinckney, the United States commissioners; 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 impressment 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 chancellor, and he 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 Lope de Vega,' in two octavo volumes. This work, which was re-published in 1817, when it was extended to two volumes by the addition of an account of Guillin de Castro and other matter, was creditable to his lordship's native familiarity with the popular parts of the 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 proved so exceedingly extended 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 promise held out by an unexplored field, but more perhaps to the political circumstances and events which for a time drew so much attention to everything Spanish. Lord Hol
day 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.'

On the breaking out of the Spanish insurrection in the last year of his life he had obtained leave 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 continuation of the same course of opposition to the policy of the Whig ministry as that which he had pursued after his entrance into parliament. He took a leading part in most of the great questions that came before the House of Lords, and particularly distinguished himself by his support of Sir Samuel Romilly's law amendments, by his advocacy of Catholic emancipation, and his opposition to the orders in council, the cession of Norway, and the detention of Bonaparte at St. Helena. However opinions 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 steadiest Whigs of the school of Mr. Fox. But in those days the boundaries of party were much more distinctly marked than they are now; and although the first kind of inconsistency that was the worst was going over openly from one camp to the other, changing from Whig to Tory or from Tory to Whig. These two great parties were relatively more distinct, and did not slide off into one another as they do now.

When the unsuccessful attempt was made through the Marquess Wellesley to effect a union of parties in January 1813, and in the same month he applied again to the Prince 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, and 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, 1834, to April 1835) till his death at Holland House on the 28th of October 1840. He was succeeded by his son, the present Lord Holland.

The only performances which Lord Holland sent to the press between these events are already mentioned in the first of the Rev. Dr. Shuttleworth in favour of the Catholic Claims,' svo., Lon., 1837, and 'A Letter from a Neapolitan to an Englishman,' which is stated to have been privately printed in 1818; but the public character can hardly be beyond suspicion, except by Mr. Marat of a conversation which his lordship had had with him. He is also the author of a translation of Ariosto's Seventh Squire, which Mr. Stuart Rose has printed in an Appendix to the Fifth Volume of his translation of the Orlando Furioso (1837), 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 free 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 it was certainly more common and ever little of what could be called brilliancy, a well-informed and full mind. Lord Holland was much beloved by an extensive and varied circle of friends as perhaps any man of his age and condition. His reputation, however, is chiefly 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.

(Hallam's 'History' of England, 1843.)

HOLSTEIN (from Saks, 'all,' and ster, 'a bone,' an antiphrasis applied to this plant because it is soft and unlike bone), a genus of plants belonging to the natural order of the Caryophyllaceae, and extending in the wild state to the temperate and northern regions; 5 petals, toothed at the end; 5, 4, or 5 stamens; 3 styles; a subhymenopus 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. umbellatam, is British. It has umbellate flowers, pinnate viscid peduncles, the pedicels reflexed after flowering, the leaves scuse, elliptical, or oblongate. It is not a common plant, but has been found growing wild in some few places in Norwich, Burly St. Edmonds, Eye, and Yarmouth.

(Ballington, 'Manual of British Botany.)
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 is in a ruinous state, and the convent is a pappel mill. Holzer was the friend of the Frankish Convent of Schwarzaeh in his accounts of the works of art in Franken, though it contains many works besides the frescoes of Holzer; those painted by Pirocco and Tello, but 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 Three Holy Hierarchs; St. Stephen; and St. Felicia 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 satisfactorily

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 live 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 he was considered an admirable landscape painter. Two of them have been published in Germany; the first in 1765, at Augsburg, and the last in the Tyrol in 1824. In the latest accounts he is called Johann Evangelist Holzer; see Nagler, Kunstlexicon, 2nd and 3rd.

(See, 'Leben Johann Holzers,' printed in Meusel's Musikalisches Artistisches Jahrbuch, 1871.)

HOMopathic, the art of curing founded on resemblance, and expressed in the Latin expression 'similia similibus curantur.' It is derived from the two Greek words συμφερειν, 'similar,' and εἰμι, 'being' 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 contrast to that founded upon 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 αλλοι, 'other,' and θεραπευειν, 'treatment.' This distinctive nomenclature will be adopted in this article as a matter of convenience, and to avoid the circumlocution sometimes employed. The contraries seem to be distinct from their opposite, and from popular experience, from observations upon the effects of medicinal agents recorded in the medical schools of various epochs, and from experiments upon healthy individuals made by the founder of the system and his disciples themselves. In his Popular experience has proved 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 contrariis).

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 in 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 contrariis), as corroborated by the evidences of John Hunter, Kennish, Sydenham, and other medical names of high repute.

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

2ndly. They endeavour to show by a number of observations compiled from the records of the homopathic schools, that many drugs recorded by them as curative in different forms of disease were observed by others, also allopathists, to produce effects closely resembling the symptoms of those very forms of diseases; or in other words, that they acted upon the principle, similia similibus: an instance or two will be sufficient illustra-

tion. The English sweating sickness, which committed such ravages in the year 1485, and for some time baffled the physicians, yielded, according to Willis, to sudoration; and it is upon record that after the adoption of this mode of treatment very few died of it. Homoeopathic surgery, the appearance of the wounds and swelling, the relief in bleeding, the fever and heavy and deep sleep; and it has, according to the testimony of many allopathic physicians, proved curative in diseases characterized by similar symptoms. Moreover, it is asserted by the homoeopathists that all the remedies of medicine are 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 adduce, and that the law upon which specific action 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 appeared to be corroborated by the work of Dr. Hone, and other great names in medicine. Dr. Alison, professor of the University of Edinburgh, observes, 'The increasing efficacy and usefulness of our art must depend upon the progress which may be made in the discovery of the cures. The homoeopathist may counteract the different diseased actions of which the body is susceptible as effectually as the cinchona counteracts intermittent fever, or citric acid the sour, or the chloride of iron the stertor of sleep.'

In his 'Principles of Medicine,' 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 homoeopathist and all other schools of medicine. The homoeopathists however assert that this is merely a point of practice to be determined by the discretion of the patient, and that in the application of the homoeopathic principle to the treatment of disease, it was soon found that remedial agents given in the doses usually employed acted energetically only in those cases which were already in an extremity; the 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 universal adoption among homoeopathists of the minute doses at 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 professional eminence in the other systems before they embraced the doctrines of homoeopathy, and seem to be more or less diffused in all parts of the world, so that one form any opinion from its literature, which comprises medical works in German, Italian, English, French, Swedish, Russian, Spanish, Latin, and Portuguese. The system has also adherents in North and South America and Asia. The great bulk however of the medical profession are more or less opposed to its adoption.

HOMICIDE [Murder, P.C.]

HONE, WILLIAM, was born in 1779 at Batli, where
his father is stated to have been an occasional preacher among the dissenters. He is said to have been so rigid in his religious notions that he would not suffer his son to be brought 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 after some time his father, finding that he had attached himself to the law, determined to take part in what he seems to have thought very objectionable politics, removed him to another master at Chatham, with whom he remained between two and three years. He then returned to London and entered into business as a bookseller and stationer of Gray's Inn; but at last he quitted the law and, having married, set up in July 1800 as a bookseller, with a circulating library, in Lambeth Walk. For a long time after this he had struggled, but was finally successful, 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, Bloomsbury; and here he appears to have remained till 1811, when on the retirement of Mr. John Walker he purchased him out; but it is called in 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 Fables, and to the work of an ancient, and, he thought, to have taken to the investigation of the abuses in lunatic asylums, 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 seven 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 it 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 with most praiseworthy humanity and spirit in the investigation of the case of the unhappy Elizabeth Penning, executed on a charge of poisoning of which there can scarcely be a doubt that she was innocent; and he published a very striking account of the case, modestly, however, withholding his own name as the author of it. He was then called in to give the literary credit to a Dr. John Watkins, who only contributed three letters, forming the least interesting part of the publication. The volume, an octavo of 240 pages, produced two thousand copies, and were sold at five shillings. In 1816 he commenced a weekly paper called 'The Reformers' 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 handsome 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. Their father, excited by the storming attack upon the since defunct daily morning paper called 'The New Times,' its editor Dr. (afterwards Sir John) Stoddart, and the Constitutional Association, or 'Bridge Street Gang,' stated (in the Independent) that his book turned out the most productive for the authors were three composed in the manner of parody upon various parts of the Book of Common Prayer. For the printing and publishing of this he was brought before the Justices for some restitution of smaller indictment in the Court of King's Bench, on the 18th, 19th, and 20th of December, 1817; the first day before Mr. Justice Abbot and Mr. Justice Tenterden, the second and third days before Lord Eldon. He was found guilty on all three trials (which were before special juries); and, notwithstanding the best exertions of the bench to procure a conviction, was acquitted on each indictment. His address to the jury on the third day, especially, which lasted seven hours and a half, although the latter part was not to be taken for what he seems to have thought very objectionable politics, removed him to another master at Chatham, with whom he remained between two and three years. He then returned to London and entered into business as a bookseller and stationer of Gray's Inn; but at last he quitted the law and, having married, set up in July 1800 as a bookseller, with a circulating library, in Lambeth Walk. For a long time after this he had struggled, but was finally successful, 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, Bloomsbury; and here he appears to have remained till 1811, when on the retirement of Mr. John Walker he purchased him out; but it is called in 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 Fables, and to the work of an ancient, and, he thought, to have taken to the investigation of the abuses in lunatic asylums, 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 seven 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 it 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 with most praiseworthy humanity and spirit in the investigation of the case of the unhappy Elizabeth Penning, executed on a charge of poisoning of which there can scarcely be a doubt that she was innocent; and he published a very striking account of the case, modestly, however, withholding his own name as the author of it. He was then called in to give the literary credit to a Dr. John Watkins, who only contributed three letters, forming the least interesting part of the publication. The volume, an octavo of 240 pages, produced two thousand copies, and were sold at five shillings. In 1816 he commenced a weekly paper called 'The Reformers' 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 handsome 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. Their father, excited by the storming attack upon the since defunct daily morning paper called 'The New Times,' its editor Dr. (afterwards Sir John) Stoddart, and the Constitutional Association, or 'Bridge Street Gang,' stated (in the Independent) that his book turned out the most productive for the authors were three composed in the manner of parody upon various parts of the Book of Common Prayer. 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island from cast 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 points, most of the promontories and headlands of Hong Kong Roads and Victoria Harbour, both opposite the town of Victoria. There is deep water for a mar-of-war within a cable's length of the shore. The harbour lies between the mountains of Victoria on the north and the South Dwarkanath forest associated with that of Hong Kong. The northern side of the island is traversed by a ridge of mountains which vary in height from 600 to upwards of 1000 feet. They present a steep declivity towards the coast, and their base approaches nearly to the edge of the sea. In the map of Hong Kong which accompanies Bernard's ' Voyages of the Musussa' (London, 1844), Mount Victoria is to be found at 2872 feet high, the Mount Crouch, 1756 feet. These two mountains immediately overlook the town and harbour of Victoria. The elevation of Mount Parker, at the other or eastern end of the island, is said to be 1711 feet. The mountains furnish a supply of excellent granite for building; and there are numerous quarries which are skillfully worked by Chinese labourers. The southern side of the island is much less rugged, and consists of an undulating surface with occasional portions of flat land. The total quantity of land suitable for cultivation is small, and the greater part of it is in one valley. Deep ravines extend from the interior towards the coast, and extend far back. The author says, 'The words Hong Kong are in fact a corruption of Hoong Keang, or the red torrent,' so called from the colour of the soil through which flows a stream that tumbles over a cascade adjacent to the site of the present town. On the 27th June, 1843, was 88°. On one occasion the thermometer rose to 92° during the middle of the day, and once only fell to 84° during the night. (Bernard.) In October, November, and December the variations of the temperature are often from 10° to 20° in the course of twenty-four hours, and the feeling of cold is greater than in many northern countries in the same months. The northern side of the island is fully exposed to the south-west monsoon, and has the serious disadvantage of being deprived by the mountains of the south-western monsoon in the hot season. At that season the climate is excessively hot, and this is succeeded by a hot unclouded sun, which acts upon the undrained parts of the surface and creates malaria. The healthfulness of the island may doubtless be improved by attention to drainage and the formation of channels for carrying off the superabundant moisture. In the cold season, when sudden variations of temperature occur, the practice of the natives should be followed, who prudently increase the warmth of their clothing at the proper time. The south side of the island enjoys the benefits of the south-western monsoon, and is healthier than the northern side; but it is destitute of a harbour of sufficient extent. The merchants of Victoria might, it is thought, have obtained this side, and at the same time proceed daily to their business.

Hong Kong was taken possession of by the British during the war with China. The cession of the island formed one of the principal conditions of the Treaty of Nanking, signed Aug. 30, 1842, they gave up the island of Chuen, and Hong Kong was ceded in perpetuity to Great Britain. The wisdom of this selection has since been doubted. [CHIABAR, P. C. S.] On the 26th of June, 1843, Hong Kong was regularly constituted a British colony. It is what is called a crown colony, that is, it is not under the control of separate assembly, but it is governed by orders from the Colonial Office at home. There is a legislative and executive council to aid the governor with their assistance and advice. The governor, as superintendent of trade, is head of the consular representatives at the five ports opened in pursuance of the Treaty of Nanking. The offices of the government are at Victoria. There is a chief justice and attorney-general, with other law-officers, and the usual departments of a colonial administration. All grave offences committed by British subjects must be tried at Hong Kong. There are four newspapers published at Victoria. At the present time the number of Chinese inhabitants was supposed to amount to about five thousand, exclusive of the best-people and migratory labourers from the mainland. The resident population consisted chiefly of civil servants, military officers, and traders, with a few and scattered sprung villages. Since the island became a British colony there has been a great increase of Chinese, and their numbers are now estimated at upwards of 30,000. They make themselves generally useful as domestic servants, labourers, tailors, shoemakers, builders, carpenters, &c., and they become of great service in the cotton trade. In the 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 were in possession, there were only about 150 Europeans, and 13 Chinese. From Canton, there was not a house on the island fit for the residence of Europeans, and Sir H. Pottinger, the plenipotentiary, lived, when on shore, in a tent. During the two months that the fleet remained here, a few neat sheds and temporary 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 completed, there had been constructed regular streets and buildings, Chinese, numerous large storehouses, substantial wharfs 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 of the limited space 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 two miles. The location of Victoria is in some other situation is thought 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 had been declared free from the bazaar of the entrance of the harbour, and near to 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 lease 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 9600 dollars from the custom-house, and its revenue from this source was rapidly augmenting.

Early in 1845 the government of Hong Kong legalized the opium trade. In March of that year this illegal drug was farmed by a mercantile house at 720 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 25 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 and silver coin is to be equivalent to 20s. 6d.; the East India Company's rupee, coined since September, 1845, to 1s. 10d.; Spanish and Mexican dollars 4s. 2d.; and 228 cash is declared to be equivalent to 20s. 6d.; the currency of the East India Company's rupee, coined since September, 1845, to: 1s. 10d.; Spanish and Mexican dollars 4s. 2d.; and 228 cash is declared to be equivalent to 20s. 6d. [BERNARD, Voyages and Services of the Nemesis, London, 1844; McPherson, Two Years in China, 1842; Loch, Campaigns in China, 1845.]

HONTHORST, or HUNDHORST, GERHARD, called by the Italian Ghirardello 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 Rome, 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 I., 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 a celestial genie is driving away Eury and Malice. For these paintings Honthorst received 3000 florins, a service of plate complete for twelve persons, and a beautiful house. Honthorst was the first Dutchman who was appointed by Queen Elizabeth to paint the court painter to the Prince of Orange. He died at the Hague in 1650. He had a remarkable number of scholars, especially among the highest classes. Savvart also was one of his pupils. The style of execution is much like that of Guercino; his pictures occur frequently in European galleries.
HOOD, THOMAS, was born in 1798, in the Poultry, London, where his father was a bookseller, of the firm of Yeates and Hood. Thomas was sent to a school in Tokenhouse Yard, 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 Hogdtsen, and they had a small brother, whose name was always addressed to Charles Lamb. A Mr. H., who subsequently became the prototype of Charles Lamb's unsuccessful farce called 'Mr. H.' Hood was afterwards sent to a preparatory school, and in due course was transferred to the 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' ('Hood's Own,' p. 292):—"In a house, formerly a suburban seat of the unfortunate Earl of Essex, over a grocer's shop, up two pair of stairs, there was a very select day-school, kept by a decayed Donnian, as he would have been called 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 terms, love-sick, guileful parents, and victims of his knowledge. As a scholar, on the contrary, he 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 went to prove that he attended to the interests of his school, not to the advantage of his own. Indeed he less resembled, even in externals, the modern worldly trading schoolmaster than the good honest earnest olden pedagogue—a pedant pernicious, but a learned one, with whose teaching a present authority 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 proficiency of his pupils. If small as was our gain, so small as easily was our power, yet infinite was our state and walked gowned and covered. His cap was of faded velvet, of black or blue or purple or red green, or, as it seemed, of all together, with a suane of brown; his robe of crimson damask, lined with the national tartan. A quaint carved high-backed elbowed article, looking like an émigré from a set that had been at home in an aristocratical dressing-room under the ancien 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 kindly eye over some dozen of youngsters; for adversity, sharpened by habits of poverty, had fixed around him, or made it possible with the peculiar red-streak common so to the healthier natives of the north. 'In a few months my education progressed infinitely farther than it had done in as many years under the superintendence of his brothers and assistants.' I picked up some Latin, was a tolerable grammarian, and so good a French scholar that I earned a few guineas—my first literary fee—by revising a new edition of "Paul et Virginie" for the press. Moreover, as an accountant, I could work a summum bonum, that is, a good sum.'

From this school he was removed to the counting-house of Messrs. Bell and Co., Russia merchants, Warfand Court, City, but his health soon began to fail, and he was sent in a Scotch smock to Dundee, and consigned to a female relation, who however refused to take charge of him, and even reshipped his luggage, and wo did have him back to London, if Hood had not quitted his native country, and never to return, he might have become a warrior, as well as a rambler, fishing, and boating. His health gradually improved, and, after remaining two years at Dundee, he returned to London. He engaged himself to Mr. Robert Spence, who was his brother's former partner to keep his book of accounts, art, and was afterwards with Le Koux for the same purpose.

In 1821, Mr. John Scott, then editor of the 'London Magazine,' the Magazine passed to other proprietors, who happened to be Hood's friends, and he was offered the situation of sub-editor. He had published some verses in the Dundee Advertiser and Dundee Magazine, while he remained at that place, which were favourably received, but he had not been stimulated to any further appearance in print. 'My vanity,' says he, 'did not really plunge me into authorship, but no sooner was there a legitimate opening than I jumped at it, & la Grimialdi, head foremost, and was speedily behind the rest of the company.'

Hood, while in this situation, became acquainted with several persons who have distinguished themselves in English literature, and who were then contributors to the London Magazine—Mr. William Hazlitt, Carew, Prosper Ollier, Sartor, Bartlett, Hasting, Elton, Hartley Coleridge, Talkford, Soame, Horace Smith, Reynolds, Fowell, Clare, Benyon, and others.

With Lord Byron Hood afterwards fell on terms of great intimacy, which continued till Lambs death.

Hood's first publication in a separate form was 'Odes and Addressas to Great People,' in which he was assisted by his brother, and with whom Hood, Reynolds, and which was brought out anonymously. 'Whims and Oddities,' published in 1826, in small 8vo, consisted chiefly of his contributions to the 'London Magazine,' with some additions. His next work was in prose, 'National Tales,' 8vo, which was followed by 'The Plea of the Midsummer Fairies, Hero and Leander, Lyceus the Centaur, and other Poems,' 8vo, 1827, 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 series of short stories, called "The Reminiscences of the World," the third series in 1828. He commenced the 'Comic Annual' in 1829, and it was continued nine years. In the same year his comic poem 'The Epping Hunt' came out, and excited much mocking from the London sporting world. 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 'the House, belonging to the proprietor of the Wanstad, in Essex, near which it was situated. While residing here he wrote his novel of 'Tyneley Hall.' Fecundity difficulties compelled him to leave his pleasant residence. The dedication of 'Tyneley Hall' is dated Lake House, Oct. 20, 1834. He left it in 1835.

The 'Comic Annual' having terminated in 1837, Hood commenced the publication of 'Hood's Own,' in a series of monthly numbers, in 1838. It consisted chiefly of selections from the proze and poetry which he had published in the series of the 'Comic Annual,' with several additions.

A portrait of himself, for whom 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 continent for the benefit of his health, but while in Holland the unwholesome air of the marshes proved fatal to his constitution. He was placed in a single chamber, and exposed to a single fingered cold, and this with the peculiar red-streak 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 under the superintendence of his brothers and assistants.' I picked up some Latin, was a tolerable grammarian, and so good a French scholar that I earned a few guineas—my first literary fee—by revising a new edition of "Paul et Virginie" for the press. Moreover, as an accountant, I could work a summum bonum, that is, a good sum.'

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Garrideb,' and his novel of 'Our Family,' which was interrupted 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 consummation, a short time before his death, of one of his most admired descriptions, or even say conceptions, which he was offered to Sir Robert Peel, transferred at his own request to his wife. After a lassitude, which continued four days, he died, May 3, 1846. He was buried on the 10th of May in Kensall Green Cemetery, in all his forms.

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. Soon after his death a subscription was commenced in order to raise a fund for the benefit of the widow and children. This 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 possessed the power of working up those materials into combinations of wit and humour and poetry 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, the great diversity of characters, arts, professions, and trades lay ready in his mind to supply the demands of his rapid and subtle and versatible 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 more so, than either of these. His skill in imitations, and the richness of humour of which Butler had little and Cowley none. His humour is frequently as extravagantly broad as that of Nabbes, but he has sometimes the delicate touches of Addison. As a poet, he was merely an imitator of Addison, and the best of the imitations of Addison with double meanings of sense in such a manner as to produce the most extraordinary effects of surprise and admiration. His power of exciting laughter is wonderful, his drollery indescribable, his fine word combination, and wit of equal excellence, so that it is very great. In some of his 'National Tales,' as well as in his singular poem of 'Eugene Aram's Dream,' he produces 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 irrepressibly as in other cases he produces laughter.

In his 'Plays of the Midsummer Fairies, Hero and Leander, Lyca the Centaur, and other Poems,' he supports a poetic character quite different from those in which he usually appeared. Without a trace of solemnity or affectation, he shows his imagination, his wit, and his humour, to be of the most brilliant and varied kind, and he displays a playfulness and delicacy of fancy, a tenderness and sweetness of feeling, a choice of diction, and beauty of versification, which render these serious poems exceedingly delightful; and the most delicate and the most serious plays are written from the same elaborate structure, it may be inferred that it cost him much labour, if not much time. In extenuation of the neglect of the public, it may however be observed that such poems can never be popular, and that the only way to make them is by not publishing them. The plays most admired are those of which the characters than they would have been without it. Those objections however are much less applicable to 'Our Family' than they are to 'Tylin Hall.' They are defective as novels, as well as as plays, and are often removed in acting.

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 pieces to which they are annexed, and are not, in general, independent of them. But still, the wit and allusion, the perception of the make and odd fancy occurred to him.

The novel tendency of Hood's works is excellent. In the indulgence of his spirit of fun he is anything but strait-laced as regards the introduction of images and phrases which a fastidious person might call vulgar or coarse: but an indescribable joviality, to say nothing of a vein of liberal-minded, a warm eulogist as well as a glowing depicter of the good feelings of our nature and the generous actions which those feelings prompt, and he is an unassuming satirist of vice, pretension, and cant, in all its forms.

Hood, in his person, was thin, pale, and delicate. In his temper he was kind and cheerful; he scarce to his social and benevolent feeling of his friend Lamb, and he was by no less than Lamb a favourite and his friend. His long continued sufferings only stimulated him to amuse himself and others by the exercise of his extraordinary imagination, and when at last he could no longer bear up under his bodily pains, his complaint was simple, but it indicated a terrible degree of suffering—'I cannot die, I cannot die.'

(Literary Reminiscences in Hood's Own; Allusions; Genius of Mountain and Other Periodical Works.

HOOK, THÉODORE EDWARD, was born Sept. 22nd, 1778, in Charlotte-street, Bedford-square, London. He was the son of James Hook, a musical composer of some celebrity in his day, by his first wife (Miss Maddin), a beautiful, 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 5th, 1828. Dr. Hook married a daughter of Sir Richard Hood, Esq., of Sideway, in 1797; and wrote two musical pieces, 'Jack of Newbury,' 1785, and 'Diamant et Diamond,' 1797, which were never printed, and two clever novels, 'Pen Owen,' and 'The Scarlet Vulture.' Dr. Hook's second wife was the daughter of Hook's mother's sister; he died in 1802, while he was yet a schoolboy at Harrow; his father did not send him again to school after the funeral; and not long afterwards he married again.

Theodore Hook was a handsome and remarkably clever. He ad a fine ear, was an expert performer on the pianoforte, had a sweet and powerful voice, and sang a pathetic song well, and a comic song delightfully. His father was employed by the Earl of Oxford, and the two Hook brothers wrote songs for him, and sometimes composed the airs. The striping soon received a free admission before the curtain and behind it, and he was highly approved of his father's profits. His father, who had taken degrees at St. Mary Hall, Oxford, and has been the history of the church, seeing the danger which the young man's character was exposed to by the pressure of dissipation, persuaded his father to send him to the University, and the future dean went with him to be entered at Oxford. But in order to go through a prescribed course of reading, he was not to commence his residence at the University till February 5th, 1798, when he was 12. He returned with his father to London. He immediately set about writing an operatic farce, 'The Soldier's Return,' 1805, which was very successful, and he gave up all thoughts of the University, and devoted all his time and energy to many other successful operatic pieces and farces — but not by his own judgment, but with the consent of his father's friends, to his brother, who had taken degrees at St. Mary Hall, Oxford, and was then advancing in the church, seeing the danger which the young man's character was exposed to by the pressure of dissipation, persuaded his father to send him to the University, and the future dean went with him to be entered at Oxford. But in order to go through a prescribed course of reading, he was not to commence his residence at the University till February 5th, 1798, when he was 12. He immediately set about writing an operatic farce, 'The Soldier's Return,' 1805, which was very successful, and he gave up all thoughts of the University, and devoted all his time and energy to several other successful operatic pieces and farces — Catch me who can, 1806; 'The Invisible Girl,' 1806; 'Tecili,' 1806; 'The Fortress,' 1807; 'Music Mad,' 1808; 'Siege of St. Quintin,' 1809; 'Musikens Mand,' 1807; 'Words and Sound,' 1809; 'Awe-ass-ilation,' 1810; 'The Will, or the Widow,' 1810; 'Trial by Jury,' 1811; 'Darkness Visible,' 1811. In 1809 (he was then only twenty) he made his first essay as a novelist by the publication of 'The Man of Sorrow,' under the assumed name of Alfred Allandale, Esq. It was a very funny work, and had no success. His life at this time was a series of roguish buffooneries. In 1809 he played off only two gambols, which are recorded on record, which is known as the 'Bermers-street Hoox.' Not only Bermers-street, but all the streets connected with it were rendered almost impassable by vehicles of all descriptions laden with goods of every kind, from the heaviest to the lightest; and persons of all ranks and professions, including the Commander-in-Chief, the Archbishop of Canterbury, and the Lord Mayor; received invitations, and most of them were morally instructed, including his conversational powers, but his talent as an improvisor is described as marvellous. He was the companion of Charles Matthews; and Mrs. Matthews, his friend, was the mother of two of the most eminent instances, not only of Hook's displays of improvisation, but of the feats of mimicry which they played off separately and conjointly. Hook was invited to perform before the Prince Regent, who was much delighted, that afternoon, to the familiar exhibitions at Lady Hartford's, and elsewhere, the ingenious
declared that 'something must be done for Hook;' and late in 1812 something was done for him:—he was appointed Accountant-General and Treasurer to the Colony of the Mauritius, with a salary and allowances amounting to nearly 200l. a year. He reached his destination on the 9th of October, 1813, 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. Towards the close of 1817, General Sir John, the governor, 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 audit-board, which stated that everything was right and exact. Some months 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 37,000 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 back to England in custodi. 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 had set at liberty with only two hundred pounds mohurs in his pocket. He took a small cottage in Somers Town, and formed connections with newspapers and magazines, by which he was enabled to supply himself with the proceedings of the House of Lords, and he lived in security, and was known only to a few of his old associates, such as Matthews, Terry, and Tom Hill.

In the meantime 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 he was named Hook, however, was not destined for provincial celebrity. The 'John Bull' newspaper was established, 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. Meantime the Whigs took care that the inquiry before the audit-board should not be dropped; and the result was, that at first the balance found against him was 30,000l., which on the strength of new evidence was reduced and the extent was issued for 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 this. But there is no proof of a 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 left 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 spunging-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 would frequently be making of its claim for the debt. He then took a cottage at Putney.

Hook published his first series of 'Sayings and Doings' in Feb. 1824, while confined in the spunging-house, and his profits from this branch of his business have to be considered sums almost as large as the profits of the other works which he published in rapid succession afterwards. The following is a list of the whole of them — 'Sayings and Doings,' 3 vols., 1824; 'Remarks,' 3 vols., 1825; 'Third Series,' 3 vols., 1828; 'Maxwell,' 3 vols., 1830; 'Life of Sir David Baird,' 2 vols., 1830; 'Parson's Dog,' 3 vols., 1833; 'Love and Pride,' 3 vols., 1833; 'Gilbert Gurney,' 3 vols., 1837; 'Births, Deaths, and Marriages,' 3 vols., 1839; 'Gurney Murred,' 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 the series. 'The Gentleman's Reminiscences,' from Kelly's notes, in 1836, without remuneration, and merely out of kindness to his old friend.

While residing at Putney he gradually mixed more and more frequent visits to the noble house of 1617, took a box in the Clift Row, St. James's, which has since been the residence of a wealthy nobleman; he became a member of divers first-rate clubs, received invitations from persons of the highest station, and was evidently anxious to get himself and deeply into debt, notwithstanding the large sums which he obtained by his literary labours. By his ambitious and criminal extravagance, which, as 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 without a question. Hook was somewhat confused and said he was in debt; but after a moment's pause, he observed: 'Well, you see me as I am at last— all the bucklings, and pinnings, and washings, and brushings, dropt for ever— a dirty, baggage, head above water.' He had latterly been much improved. 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 the more romantic side of her, then, 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 principle sufficiently strong to restrain the impulsion 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 not of the highest art and humour, were so 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 novels are sketches rather than novels; they contain indeed 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, natural, and pointed manner, so true a representation of the time 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 if they are worth publication.

(Quarterly Review, May, 1842, an entertaining and instructive work, written in a fair spirit, by an editor who knew Hook well; Gent.'s Mag., Oct. 1841, a bad article, written in a spirit of absurd enmecum.)

HOOLE. (Tasso, F. C.)

HOPE. THOMAS, drawn and rendered from the wealthy family of the 'Hopes' of Amsterdam, and possessing with more than ordinary taste far more than ordinary means of cultivating and gratifying it, this gentleman established for himself an usefulness and reputation as a brother 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 precocious talents and a hand to the world, as in his childhood, a key of art which seems 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
favorite amusement. I was scarcely able to hold a pencil, with which I copied all the faces, the figures, and all the other ob-
jects of which the imitation chiefly delighted the gen-
erosity of such children as show a turn for design, I already
began dealing in those straight lines which seem so little 
adorable in the hands of those who are acquainted with the 
thirty-fifth of a more advanced age. No sooner did I become master 
of myself, which unfortunately happened at the early age of 
eighteen, than dissuading any longer to ride my favourite 
hobby only in the confinement of a closet, I hastened in quest 
of food for it in all the different countries where any could be
expected. This valuable little scrap of autobiographical amply 
indemnifies us for the absence of more matter-of-fact account 
of his youth but sufficiently displays the author's sincerity and te-
teen, 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 archi-
etecture induced him to explore regions that were then consid-
ered almost beyond the track of civilization—to study the 
monuments of Egypt on the banks of the Nile; those of Ionia, 
Northern Greece, the Peloponnese, and Sicily; those of the 
Tartar and Persian styles in Turkey and Syria; of the Moor-
ish and Arabian on the coasts of Africa and in Spain; those of 
the Etruscan, Lomardic styles, &c. in Italy; and finally, 
those of the Gothic, in France, Germany, Spain, Portugal, 
and afterwards here at home.

Eight years, he tells us, were thus occupied by him with a
persuasive application that would have daunted most profes-
sional men. From 1800 to 1809, he resided in Naples, 
tended with many fatigue and privations, and frequently with 
great risks.

Soon after his return to England he began to apply his
skilful taste and elegant execution to the decoration of 
Duchess Street, Portland Place, extending the plan of 
the original house very considerably by galleries carried round
three sides of the court-yard. Of these rooms, which are in
continuous order on the west, as many as fifteen, they consist of little more than five floors, the
largest one (about 100 feet by 24) is on the north side, 
and the others, consisting respectively of a suite of small cabi-
nets filled with Etruscan furniture and vases, on the east 
side, forms the 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 furn-
ished the interior in a style of refined classical taste that was
then a decided novelty in this country. His first and memo-
rable publication on Household Furniture, in 1805 (a splen-
did folio volume with sixty plates exquisitely engraved in out-
tone), was the work which shows that his taste in furniture and decorations of his own mansion], created a revo-
lution in taste. But it also drew down upon him the mere-
less ridicule of the Edinburgh Review, which could not 
resist attacking at the gentler upholsterer. Yet, unless it be
perfectly indifferent whether good or bad taste be shown in such
matters, the reform in furniture of which Mr. Hope set the ex-
ample, 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 effectation of vulgar and
parodying imitators, a very improved style of furniture—
one marked by greater simplicity and intrinsic beauty of form
has taken place and still prevails, where it has not been super-
seded by the tawdry frivolity of the Louis Quatorze and
other fashions.

In 1809 appeared his Costume of the Ancients, which had
already appeared in a prospectus of 1808. 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 Theatres. Mr. Hope had
become somewhat less equal to his tasks; yet his books were
his guide, and his design his rule. In 1813, he published 
with his eldest son, J. Hope, a work on Household Furniture, which was
commissioned to execute his Jason for him in marble, now in the gallery in Duchess Street. But he
had been not always so fortunate as to select worthy objects of 
gastronomy, for in one occasion he bestowed it where it was altogether unmerited. Some dispute arising between
him and a French artist named Dobest, the latter
charged Mr. and Mrs. Hope, and announced under the title of 
"A Summary of His Works." 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 mari-
lized the picture and pronounced her the best 

painter of the day. This was not without effect, for the author, that it was at first consider-
ately attributed by many to Lord Byron, as the only person 
capable of having produced it; and certainly Mr. Hope's prev-
ious pursuits and publications were by no means of a kind 
to point it out as likely to be the author of a book of such

character. Of fiction. Of his two last works, both of them published posthumously, one of them was even still more remote from
what may be supposed to have been the constant temper of his studies, for that 'On the Origin and Prospects of Man'
was almost the very last subject that would have been ex-
pected from his pen: from furniture to cosmogony the dis-
tance is immeasurable. 

ology and literature of the United Kingdom: it is, however, a less mains 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 and descriptions in the Rooms of the British Institution, from 1813 to 1823.)

HORN. Mr. Arthur Aikin, in a paper on the manufacture of horn, tortoise-shell, and whalebone, read before the Royal Society, 1829, 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 to express two quite different substances, namely, the branched or double horn, or the scarified horn which is sometimes called the unguinated horn of the ox genus, and other kinded genera. Of the former kind, which are, with few exceptions, confined to the male sex, and which are reproduced annually, an account is given under Dama, P. C., p. 346. 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 pronounce the same corne (while they apply the same bois 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 [Antilocapra, P. C., n. 11], which are not referred to by Aikin, arc, he observes, 'never branched or palmed, but are always of a simple conical figure, more or less curved, and, in some of the antelopes, spirally twisted; they are found in both sexes and both kinds. The horns of the goat and sheep are much larger in the male than in the female.' In 'all these animals,' he adds, 'a bony core, of a loose texture and conical figure, rises from the bone of the forehead, covered by a permanent vessel, which, in the course of time, secretes thin layers of horn in constant successions.' It is supposed 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 permanent, 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 thickness of which 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 traces the connection between the substance of horns, nails, claws, and the bones of animals of the quadruped kind, lizards, serpents, and fishes, hair, feathers, and even skin. In the case of tortoise-shell and the armour, or covering shell, of the pangolin and armadillo, the identity of the material, in the form, and in some cases even in the character is sufficiently obvious; and the horns of the rhinoceros appear to form a link with the hairy covering of hoofed mammals generally, the bards of the boar tribe, and the spines of the needle-hog 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 considerable magnitude at the base of the horn, and which become smaller towards the point, these interstices being, in the living animal, filled with a jelly matter. Whalebone, also [Rhinoceros, P. C., pp. 294, 295], is represented as illustrating the structure of a horn to hair; but its use in the arts differs much from those of horn. It is softened by boiling in water for some hours, and then cut into suitable lengths. It is used, to a great extent, its transverse division being effected by splitting, or separating its fibres. It is usually of a dark colour, but which appears jet black by dry. It is much used in the manufacture of caskets and curiosities, in stiffening and supporting other articles. The large quantity of female dropt in whale-making, and in various other ways. White whalebone is also manufactured into very elegant bonnets, and occasionally into artificial flowers of great delicacy and design, of which many are by dry. The principal kinds of horn employed in manufacturing operations are those of oxen, to which the hoofs of the same animals may be referred. The horns of bulls and cows are preferred, those of bullocks being thin and of a coarse texture; a 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 domestic supply being unequal to the demand, great quantities of horns are imported from other lands; and, 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 to be preferred as whiter and more transparent than those of cattle, and less liable to injury from the sun or winter, according to Dr. Ure, by which operation the membrane which lies between the core and the bony sheath is so destroyed or softened by heat as to make it easily extracted. Those, Aikin observes, are not thrown away, but are burnt to ashes, in which state they form the best material for the small tests or cupples employed by assayers of gold and silver. In some cases, according to Balbigo (Economy of Machinery and Manufactures, p. 164), 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 sent 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 making the horn powder by which ivory is made, and for a frame-saw, and is employed for making knife-handles, umbrella-handles, the tops of whips, buttons, and various other articles. The remainders of the horn, which is employed for purifying waxes, is thin lutes, which, when they are thrown out of the horn, are so short that they are not of much consequence, and are 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 combs, 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 boiling water for about half an hour, by which it is softened; and, when hot, is placed upon the hot fire of a coal or wood fire, until it acquires the temperature of melting lead, and becomes so soft as to be malleable. 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 rewarded by the Society of Arts in 1827 for a machine for accomplishing this object much better than in the usual way. His apparatus, which is described in an article of the Society's 'Transactions,' p. 164, consists simply of a block of cast iron pierced with a conical hole, and a conical plug of the same metal, about one-eighth of an inch less in diameter than the hole, which is driven into the end of the fire to about the temperature of melting lead. The block is then taken out and placed on a firm support. A piece of horn, which, if intended to be spread out flat, should be previously boiled in a vessel covered with water, so that the water be not boiled so as to prevent the entrance of air, is put in the middle of the heated plug. It is then boiled out, and the horn, which is sufficiently soft to be opened out, is removed. This apparatus is said to effect considerable saving of time, in adding 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 then performed in the semi-fluid state, by a strong pointed knife resembling a penknife, and, by the application of two pairs of pincers, one to each edge of the slit, the cylinder or cone of horn is opened until it is nearly flat. Several forms are then employed to pressure between alternate plates of iron, previously heated and greased, to prevent the horn adhering to them, either in a press, or by placing them vertically in a strong iron trough, and compressing them with water, then the pressure is increased or decreased by an engine, the pressure being regulated by leading the water applied depends on the intended use of the horn; if it be intended to form very thin leaves for making lanterns (or lantern-horns, as the word was formerly written, apparently with reference to the form of the prongs of the scissors), the pressure must be sufficiently strong to break the gristle, and cause the lamina of the horn to separate a little, so that the edge of a round-pointed knife may be inserted between them to complete the splitting or separation. The thin sheets of horns are then
HOR

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escaped with a blunt or wire-edged draw-knife, upon a board covered with hull's hide, and when thus smoothed and brought to the required thickness, they are polished by a woollen rag dipped in the same. The smoothness is thereby brought to the palm of the hand. The painted toys known under the name of Chinese sensitive leaves, which possess the curious property of curling up if they were alive when laid upon a warm hand, or near a fire, are made of the horn of the tortoise; they are composed of the skin of this animal which is an essential ingredient in albumen, with the lead dissolved in the alkali, and thus introduced into the substance of the horn. Some other dyers are mentioned by Dr. Ure.

No part of the horn mentioned above possesses its value. 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 employed in the manufacture 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 Dalhage in the work above quoted, 'they have comparatively little effect, but during the next four or five years their efficiency is considerable.' The shavings of the lantern-maker, from their extremely thin and divided form, produce their full effect on the first crop.

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

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. John Hewlett, of Shacklewell, 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 commenced his practice.

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 observe the regulations and practice of 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 salacity by men of congenial opinions in London, by 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 thrilling time. The French 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 in 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 23rd of June, 1809, Lord Kinnaird, of a ministerial seat in the House of Commons, which, after consultation with his friends, was accepted, and in Nov. 1809, he was returned for the borough of Bedford. Fox had just formed the Whig party, which he had held together, immediately fell to pieces. A new parliament was summoned, and met on
the 16th of December. This parliament was very short-lived. A change of ministers took place on the 5th of March, 1807; premature in its character, and the bill proposed on the 29th of December immediately afterwards dissolved. Horner did not obtain a seat at the general election, but in the following July was elected for the borough of Westminister, as the interest of Lord Elgin and Mr. Carrington. He spoke little at first, on matters of business only, and briefly. By degrees he began to take a part in great questions. He entirely coincided with the Whig party in their condemnation of the course of the Spanish fleet; he voted from their shrinking policy on the question of the Spanish war. In May, 1809, he resigned his seat at the Board of Commissioners for investigating the debts of the Nabb of Spain, and was succeeded by Mr. Henry Bouverie. In a letter of existing in a short time, he was opposed too much with the pursuit of his profession. On the 1st of February, 1810, Horner made a motion for an inquiry into an alleged depreciation of bank notes. The subject was one which he had studied extensively, and he made a very decided impression on the House. He was appointed a member of the Bullion Committee, and by the which he took in, by his share in drawing up the report, and by his speeches on the question in the House, he acquired a solid reputation and a position and influence there which he afterwards rather augmented than diminished. On the Regency question he spoke on the side of his friends with great power and effect. In the negotiations for the formation of a ministry by Lord Grenville in 1811, Horner was offered the situation of one of the Secretaries of the Treasury, but he declined the offer. In the general election in 1812 he was not returned as a member, but by the intervening year, he was elected for St. Mary-le-bow, through the interest of the Marquess of Buckingham. In the sessions of 1813 and 1814 he took a prominent part in the debates, and became one of the acknowledged leaders of his party in the House. He supported the great scheme of the nanopneum, and made the tour of Genera and the north of Italy. In the great crisis arising from the return of Bonaparte from Elbe, when Lord Grenville urged the necessity of a war and Lord Castlereagh hesitated, the latter was convinced which the country seemed disposed to enter upon it, Mr. Horner supported Lord Grey, and the difference of opinion seemed to be so irreconcilable that he offered to surrender his seat, but the Marquess 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 advised by his physicians to spend the winter in the south of Europe. 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 the burdens for future studies with an exemption. On the 6th of February his difficulty of breathing came on with increased severity. He died on the 8th of February, 1817. His body was opened, and his com- pressions found to be, not consumption, but induration or hard matter of the lungs and enlargement of the air-cells to an extraordinary extent. He was buried in the Protestant cemetery 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 subscription 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 and acute, but the subject of imperfect health. 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 science. He was one of the editors of the Edinburgh Review, and wrote many articles for it. As a public man his independence was unquestionable; his integrity, sincerity, and moderation were acknowledged by his party. He was a man of great observation, and equally free from any kind of affection or any trace of rancour. As a public speaker he was grave and foreboding, without imagery or any of the accessory ornaments, but with an earnestness and evident sincerity of manner which produced an effect greater than he could have done by any appeals to the imagination or the passions.

(Memoirs and Correspondence of Francis Horner, M.P., edited by his brother, Leonard Horner, Esq., F.R.S.; Querries of the 20th of April, and was)

HOROLOGY. A general notice of the history of the chief peculiarities in the construction of the principal kinds of clock and watch. First published in the Gentleman's Magazine in P. C. p. 297; and under Chronometre, P. C. p. 134; JEWELLING of WATCHES, P. C. p. 117; Pendulum, P. C. p. 402; and Watch, Repating, P. C. p. 107, are further and more particular particulars. The principal object of this article is to supply information respecting some important modern improvements in the construction of the large clocks used in church-towers and public buildings, the names of which 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 circumstance 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 under 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 mechanism of such a clock is given in a paper 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, Limehouse, with a large turret-clock in the churchyard. The clock consists in the circumstance that it is frequently required to indicate the time upon as many as four different dials, on the four external faces of the tower in which it is mounted. This apparatus is usually enclosed in a primitive and beautiful manner, by placing the clock in or near the centre of an apartment either on a level with the external faces, or above or below them, and causing the motion of the axis which under ordinary circumstances would carry the minute-hand (which revolves once an hour), to be transmitted by bevil-wheel to a vertical rod, the opposite end of which carries a horizontal wheel-wheel nearly on a level with, and situated centrically with reference to, the four external dials. The motion of this central wheel is communicated, by four vertical bevel-wheels of the same size and number of teeth, ranged round its circumference, to four horizontal rods, the opposite ends of which, passing through the several dials, carry the four minute-hands. At the back of each dial is a series of wheels and pinions, technically called the motion-work, precisely resembling that described in the vertical watch under HOROLOGY, P. C. p. 302, by which motion is imparted to the hour-hand, which revolves once in twelve hours. As in the case of the eight-days' spring clock, described in the preceding article, the weights and the striking apparatus are provided for by separate trains of wheel-work, each of which is impelled by its own moving power. In a turret-clock, the moving power is supplied by a huge clock-work of the moving or going-train, by the oscillations of a large pendulum, and in that of the striking-train by the resistance of the air to the rapid revolutions of a fly or fan set in motion by the wheelwork. In the arrangement of these trains, and in their connection with each other, there is nothing which requires special notice here, as these matters may be readily understood from the account of a spring-clock above referred to. Owing to the necessity for using a very heavy hammer to strike the hours in a church-tower, the power required for working the striking-train considerably exceeds that of the going-train. In the Limehouse clock above referred to, the going weight is about 1600 pounds, and the striking weight is about five hundred pounds. These weights are wound up in most cases, weekly, by means of which handles and toothed wheels connected with the massive drums round which their ropes are wound are raised by means of a coiled spring or the clockwork of the going train. The striking clock is independent of the going-train by its striking apparatus being directed by guide-pulleys. In this clock the pendulum, which is motioned with a large clock, is about fifteen feet long, is about fourteen or fifteen feet long, is about of weight, being of a mass of cast iron shaped like a double convex lens, about thirty inches in circumference and weighing about two hundred pounds. Each of the four clock-faces is fitted for the striking of hours by each pair of hands weights 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 Linthwaite clock, the beam 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 bell, 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](image)

In this cut a represents the pin-wheel, corresponding to the wheel f in the striking-train of the clock represented in Horolog. P. C., p. 300, Fig. 1, by the action of the projecting pins of which upon 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. 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 deton. 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 operation 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 its circumference, was ruled in a direction perpendicular to, or at 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 levers worked by the hand on each of these lines was marked the name of the note represented by it. This series of lines was then crossed by another series lying parallel with the axis of the barrel, which divided the circumference of the barrel into as many equal parts as there are bars or equal divisions of time in the tune. These spaces being then subdivided by other lines, according to the number of minutes, or quarternotes in the required tune, 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, as regulated by the bar-lines and by the subdivisions of the time of each dot. The dots are then transferred upon the barrel, and the pins were inserted at the points indicated by the marks on the paper. This comparatively rude and simple process, though in which each bar is made, by shifting a little longitudinally upon its axis, to perform several tunes, indicates the principle common to the pricked barrels of chimes, musical snuff-boxes, and barrel- organs.

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 every respect, 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 shortening labour, and raising 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 Graham 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 the latest 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, and 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 are perfectly of the same kind and quality, 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 machines were found to be, in consequence of the justice of the theory, inferior to those employed by them, so continually out of order that he was compelled to call in the assistance of engineers to repair and work them; but now the clockmakers and engineers work together in the most cordial manner, and with the most satisfactory result.

One of the first points which would strike an observer in the 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; scarcely any of the being 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 on account of the superior 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 in France for forty years past. In some Exchange clocks, with many other turret clocks of the same authority, wheels of wrought iron were used, but the teeth of these bad to be cut in the same manner as those which have been described, and which are used for the purpose, 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 circumstances that any imperfection in their

P. C. S., No. 92.
action would impair the correctness of the clock, which is not the case with the striking train, are best made of hammerd brass, which is a material more to be depended upon than gunmetal. 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 Academy in November, 1844, in which he states that the geometrical form of the wheel-teeth in chronometers, watches, and clocks is seldom attended to by the persons who either cut the wheels or make the pinions; which he thinks may be explained from the circumstance that these operations are being separated into two distinct trades. The system pursued by watchmen to insure what they suppose to be the proper form of the wheel-teeth is, he observes, the style of polygon (the driven) the hypcycloidal curve, putting nearly the whole of the curve on the wheel-teeth, increasing the circumference beyond the geometrical circle, by the addition of three teeth and spaces, allowing only 0.5 of the circumference of the pinion, just to remove the possibility of any sharp edge. In every case the curvilinear curve has been described by rolling the semi-diameter of the driven on the geometrical circle of the before named, the curves of the tooth of the pinion, and the teeth of the pinion; the latter should be cut for the purpose of ascertaining the breadth that the wheel-teeth should be in excess above those of the pinion-leaves; for as the breadth of the wheel-teeth is increased, the errors of the pinion are increased, the teeth driving before and after the line of centres is varied. Mr. Dent has also applied this theory to the lifting of the hammer, both for the striking apparatus and the chimes, by using polygonal, hypcycloidal 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 hemp ropes for suspending the weights. The firstmentioned of these improvements renders permanent accuracy of form more attainable, while the latter obviates, in consequence of the much smaller size of the barrel, the necessity for overlying the length of rope may be collared 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 upon the barrel, while covering the barrel in two or three layers, its effective force is of necessity greater at the commencement of its descent, when 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 of the barrel alone. Another important arrangement, which, though formerly in use, has been departed from, and is revived in this clock, is the driving of the hands of the clock, and the raising of the hammers of the striking apparatus directly from the axis of the driving-barrel, without the intervention of any wheels and pinions.

A peculiarity that has hitherto been a public clock of unexampled accuracy, the Graham Committee required that the Exchange clock should have a compensation-pendulum, and the operation is introduced as one of the important steps to show permanent correctness time upon the dial, but also to tell it with accuracy by noting the first stroke of the hour upon the bell true to a second. This degree of precision is unattainable with the ordinary 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 slight variations in the pressure of the hammer upon 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 mechanism with certainty to produce such a result. In the Exchange clock this difficulty is provided for by an arrangement for moving the lever and hammer nearly to the position it occupied 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 projection or hook which projects from the pendulum, and which, when it is instantaneously released, and thus the stroke is produced without being affected by the preliminary operation of raising the hammer.

The principle 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 of a comparatively simple construction, which appears well adapted for this purpose, as near as the pendulum is of steel, and is sufficiently long to pass completely through the bob or weight, which, however, is not immediately attached to it. Upon the bottom of this rod is fixed a nut, by turning which the length of the pendulum may be readily adjusted, and upon which stands a hollow or taperular column of zinc, through which the steel rod passes freely. On the top of the zinc column is a metal hop, 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 suspended. Thus, when the temperature of the steel rod and the two smaller steel rods by which the weight is suspended, expands downwards upon any increase of heat, the position of the weight in reference to the point of suspension of the pendulum is not materially affected, 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 proportioned to its length. The weight is supported upon a point in the central portion of the zinc column, which in consequence of pendulum. The action and cock, which in consequence of the striking mechanism, 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 possible to give, externally, a mathematically correct form to a glass jar, the interior cannot be made of a perfect figure, and consequently the column of mercury which it contains cannot be a perfectly regular cylinder. 'This condition,' Mr. Dent observes, 'combined with the irregularity of expansion which glass is known to exhibit, may be remedied by the employment of a suitable substance for the compensating measure of the pendulum, and in addition, in order to render the measurement and calculation, with regard to the column, so vague and deceptive that they are never employed.' These defects have been removed by substituting a jar or cylinder of cast iron, which is known to expand much more than glass, and moreover as it is with glass, for the ordinary glass jar. This material may be brought with the utmost accuracy into the required form, and although the sects 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, it is necessary to put in the tube at the proper time. 'The clock-maker may do it himself on the first putting of the machine together,—may adjust the column,—may then hermetically seal it, and dispatch the pendulum to the most distant countries with the adjustment so perfect that
it may be instantly attached to the wheel-work by any workman capable of coping with a clock, and which, 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 expelled at the greatest facility with the least chance of the process of boiling, without removing the mercury from the case.

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. It is fastened to the bottom of the case, in 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 pins attached to the escapement. 'In this old arrangement,' the inventor observes in his published Abstract from Two Lectures on the Construction and Management of Clocks, Watches, and Chronometers 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 two 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 entirely.'

Returning to the turret-clock at the Royal Exchange, in which the connection of the pendulum with the wheel-work is of the more ordinary 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 Bourse 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, which is exposed to variations of force and resistance from the resistances of the escapement friction, the oil, and the like, by way of lubricating the mechanism (the use of which, however, is limited to the least possible degree), and from the effect of the wind upon the large hands of the four external dials, which in the case of a turret clock is a variable force; but is provided with a small secondary train, set in motion by the descent of a ball or weight, which is itself raised at intervals of twenty seconds by the mechanism of the going-train. 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-train, 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, in other words, by which the measurement 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. To prevent the backlash of the brass teeth of the dead-beat escapement, and has the pallet jewelled with large sapphires; but in his ordinary turret-clocks Mr. Dent uses a modification of Leparte's escapement, over a single pin. In an early clock he introduced a contrivance for maintaining the motion of the wheels during the time of winding up, which was invented a few years since by Mr. Atry for the clock-work of the great Northumberland telescope at the university of Oxford; and he describes it in a publication made by request from 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. 301, 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. 3, 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-plate at h, and to the end of which the end of the line l, j, 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 i. While the clock is going in the ordinary way the descent of W causes that part of the line marked f to be in 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 action of the weight W (through the line f), and the resistance of the pinion j, produce a certain pressure on the lever-frame at g, which causes the end l 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 i; but so soon as, by the operation of winding up the clock, the pressure upon j ceases to operate, the stress of the weight upon the portion of the line marked a, which turns as it were in one piece with the lever-frame round the axis h, thereby producing a pressure upon the pinion j exactly corresponding, if the axis h corresponds with the point at which the strain of the line l is applied to the rope-barrel, in the pressure which is exerted during the ordinary action of the machine.

The machinery connected with the Exchange clock for chiming tones upon a set of large bells in the turret has been constructed by the same general plan as the mechanism of the clock itself; but, owing to difficulties in the tuning of the bells, it is not yet (Nov. 1846) brought into action. These chimes will be the first constructed in this country to play tunes in
H. O. W. H. O. W.

harmly, two or more notes being struck simultaneously upon different hells, 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 bring the hells into more perfect tune than is necessary in singing.

**HORSE-RADISH.** [Courgeta Armorica, P. C. S.]

**HORSE-SHOE.** [Horse, P. C. S.]

**HOSPITALS.** [Templars, P. C. S.]

**HOTTONIA,** a genus of plants belonging to the natural order Primulaceae. It has a 5-parted calyx, divided almost to its base, the stamens, 5, inserted and included in the tube of the corolla; the capsules many-seeded and 5-valved, with 10 teeth. *H. palearis* has the flowers whorled, stalked, and seated upon a long solitary cylindrical cymose peduncle, the corolla longer than the calyx, the leaves pinnate. It is a native of Great Britain in ponds and ditches, and is called the Water-Violet. The leaves are submerged 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.

(Fishingman, Manual of British Botany.)

**HOUBRACKEN,** the name of two distinguished Dutch artists in London.

**Arnold Houbraken,** the father, was born of a good family at Dort, in 1660, and was the pupil of Samuel van Hooegeest. He painted history and portrait, and executed many buildings. He retired with his family to Amsterdam; and he visited this country and remained here eight or nine months, for the purpose of making drawings of some portraits by Vandyke, which were engraved by Van Gunst. He left some papers, chiefly notes for his account of the lives of Dutch painters, with portraits engraved by his son, in continuation of Van Mander—"Grote Schouwburg der Nederlandische Konstschilders en Skilders," in three parts. The first two parts of this series 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,** an admirable engraver; in execution of his own designs, and even some designs of others. He was born at Dort in 1698, and accompanied his father when very young to Amsterdam. The excellent etched portraits of painters in his father's "Grote Schouwburg" are among his earliest works, yet they are certainly some 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 Knights in 1748; the excellence of some of these heads must be seen to be comprehended.

**Veree** was a good engraver, and executed a few of the heads in this collection; but his inferiority to Houbraken was so apparent, that he did not possess so much confidence on his engraving. Some of the heads, however, which were engraved by Houbraken, though of the highest excellence as works of art, want authenticity as portraits, as, for instance, those of CARR, Earl of Northumberland, and S. W. T. Secretary. The excellence of some of the Specimens of this series is so great, that they are surpassing. [Veree, GEORGS, 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 Gool, Nieuwe Schouwburg der Nederlandische Konst- schilders, &c.; Watelet, Dictionnaire des Arts, &c.; Huber, Manuel des Amateurs, &c.)

**HOUSE.** [Horse, 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. and P. 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, *Floors*.

A floor of a single story is sometimes 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 limited to the 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. We must understand the floor to be the principal 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-

\[\text{ings, partition walls cannot be allowed, the support of the upper floors, supposing the span to be too great for being sustained by the external walls alone, may be assisted by means of brick piers or iron columns. Where, owing to the subdivision of the upper stories into smaller rooms than the lower story partitions are framed without support from beneath, they may, as explained under } \text{Carpentry}, \text{ P. C. S., p. 233, not only be so constructed as not to throw any weight upon the floor, but, if necessary, so as to assist in supporting.}]

An ordinary wooden floor may be considered as consisting of two distinct parts: the actual flooring, or platform of boards laid upon the floor joists, which are framed either horizontally or on an angle, and are commonly called the naked or cassar floor, upon which the boards are laid, and which may be constructed in various ways, according to the strength required, and the span or width of the area to be covered. The simplest, and, under ordinary circumstances, the strongest kind of cassar flooring, or, as it is sometimes called, floor of joists, is that known among carpenters as a single framed floor, or, according to some writers, single flooring, which consists of a single row or horizontal tier of timbers called joists, or, more specifically, floor of joists, which, in order to dispose their strength in the most efficient manner, are made much deeper below the centres of the floor-joists than the ends which bear upon the sub-floor or walls, or in some cases, where the walls are too far apart, upon stout beams called girders, which may be strengthened by trussing. To the upper edges of these joists the flooring-boards, or, as they are called, flooring-tubs, are laid by their longer edges supported by the wall on which the ceiling of the room beneath is formed. The ends of the joists rest upon timbers loft into the wall, called wall-plates (Built- plate, P. C. S.), and against which they are equally distributed along the wall; the connection between the joists and the wall-plates being formed by cogging or cocking; or, as it is sometimes termed, encaust or encaulking, as illustrated under Black, P. C. S. In the ground floor of in inferior buildings, the ends of the joists are laid immediately upon the brickwork, without the intervention of wall-plates; but such a practice is highly reprehensible, as it not only leaves these ends of the joists unsupported, but permits them to be laid directly beneath the planks, to the exclusion of those on each side, but also prevents that evenness and solidity of bearing which is necessarily to keep the joists to a true level, that the pressure of the flooring-boards upon them may be uniform. Joists for a single framed floor should never be less than about two inches thick or wide, because of their liability to splitting with the operation of nailing down the boards, nor should they be much more, because, as will be better understood from *Plastering, P. C. S.,* any increase in the width of their under edges interferes with the key or hold of the plaster, which arises from its passing up between, and swelling over, the ends of the laths. In laying the flooring-boards, if they are used, narrow fillets may be nailed along their lower edges to receive the laths, instead of nailing the laths immediately to the joists. Such fillets are called *furrings,* and their application is of the utmost importance to the abovementioned purpose of rendering the ceiling perfectly flat, which a floor of joists never is, especially upon its under surface, owing to the roughness and warping of the timbers, is termed *furring down.* Furring-up is the contrary operation of laying slips on the upper edges of such joists as may happen to be below the proper level, in order to produce a perfectly horizontal bed for the flooring-boards. The depth of the joists, and their distance apart, may be varied according to circumstances, the former ranging from about nine inches to fifteen, and the latter being usually twelve inches, though a distance of twelve inches from centre to centre, leaving an interval of about twelve inches, is to be preferred. The strength of such a floor may be increased to any degree by increasing the depth of the joists and diminishing the intervals between them.

The best method of preventing warping of the floor, by which the strength of the floor would be greatly impaired, is guarded against by the introduction between them of small diagonal struts or braces, as represented in the cut Fig. 2, in a subsequent section, and crossing the staves, which are placed in rows extending completely across the width of the floor, at right angles with the direction of the joists, and at intervals of not more than five or six feet. These struts are not commonly necessary, but, if the joists are short, their effect would be increased by either nothing the joists to give them a proper bearing, or, without cutting into the joists, by nailing triangular fillets to them to afford abutments
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 name, the strength imparted by it is not only increased 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 through without piercing the joists, rather below the middle of their depth, be forced 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 it will be necessary to strengthen even such floors, as it is advisable in every case 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 through without piercing the joists, rather below the middle of their depth, be forced up into a convex form, whereby its strength will be enormously increased. 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, shutting against a wall in which is a fireplace with chimney-flues in the jamb. In this cut, a, a are two of the ordinary joints, the ends of which are supported in the

Fig. 1.

usual way upon wall-plates; b, b are two joints 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, d are the trimmed joints, 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 over the space between the trimmer and trimming-joists by a flat brick arch, sometimes called a brick trimmer, turned between the wall on one 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, b.

The chief objection to the use of single flooring are, that the construction offers little obstruction to the transmission of sound from one room to another, and, for the sake of the ceiling, the joints 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 joint is made an inch

Fig. 2.

or an inch and a half deeper than the rest, and a series of slight bars called ceiling-joists, of which is shown in the cut at a, is nailed, or notched and nailed, to these deeper joints, so as not to touch the intermediate joints, and to these the ceiling laths are nailed. By this arrangement the joints 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 joints, which would cause the ceiling to crack.

In a double, or more properly a double-framed floor, three sets or tiers of joints 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 a rack of circumstances, but are usually about six feet; and they are surmounted, at right angles with their own direction, by a series of smaller joints, called bridging-joists, which may, if necessary, 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 the ceiling joists to be notched only in the edges nearest to the header, but also that in every case the height of the binding-joists (or of the flooring-joists in a single floor) are always in a state of tension, and therefore cannot be cut at any angle incurving the floor; and, while those towards the upper edge of the binding-joists are in the opposite state of compression, and may consequently be cut without danger, provided that the notches made in them are filled with an incompressible substance. As a floor, when well season, is more compressible laterally than longitudinally, or across than along the grain, it is obviously better to avoid cutting into even the upper edge of the binders, because the bridging-joist, though it may fit the notch in the binder very tightly, will inevitably be more liable to compression than the portion of the binder which is cut away to receive it. Sometimes the ceiling-joists, instead of being fastened underneath the binders, are cut into short lengths and fixed between them, with only a sufficient degree of projection below them to keep the ceiling clear of the binders. Some builders, in such a case, mortise the ceiling-joists into the binders, employing a chase-mortice at one end to allow the ceiling-joist to be slipped laterally into its place after the binders are fixed; but as the mortar cannot fail to weaken the binders, it is far better to nail projecting slips within the lower edges of the binders, and to note the ends of the ceiling-joists so as to fit on to, and to be supported by them. In either plan it is necessary to nail small pieces of wood beneath the binders to prevent the edges of the joint in the ends of the binders from being exposed to the open air, in order that the hold for the laths may not be interrupted. Bridging-joists must be distinguished from the short pieces of timber called bridgings which are fitted between the joints when a quarter partition is to be put up against them, to support and afford facilities for nailing down the sill of the partition.

In floors of great span, girders, which are large beams usually supported by columns let into the walls [Building, P. C. S., p. 248], or by iron columns, are used in conjunction with bridging, binding, and ceiling joists. Girders, which are used for longer beamings or spans than bending-joists can be trusted for, are, when of timber, made of one or more pieces according to the length required and the size and strength of timber that can be obtained; but in modern buildings they are very frequently made of wrought-iron, pieces of wrought-iron being sometimes bolted along each side, to afford facilities for fitting the bridging-joists, which are usually secured to the girders by tusk-tenons. By the aid of trussing, which, however, is of very doubtful value if the depth of the true beam is requisite, its power, to that of the beam, girders may be strengthened to any required degree, whether they be made of wood or iron. The principles upon which this effect is explained are applied under the names of 'Blackwood, P. C. S., vol. ii. pp. 218, 219, 231, 319, where is also a notice of Mr. Smart's suggestions for the further introduction of wrought-iron into floors and roofs.

The size or scantling of the various timbers in a double framed floor must of course be in accordance with the circumstances, being governed 'Architectural Dictionary,' art. 'Carcase Flooring,' says that binding-joists may be about ten inches by four, bridging-joists five inches by two and a half, and ceiling-joists about three inches by two inches and a half; the intervals being from four to six feet between the binders and eleven or twelve inches between the bridging and ceiling-joists. In the article 'Naked Flooring' in the same work he gives a minute account and illustrations of plans for constructing floors to the air for at least twelve months before they are used, the reason for planning them before this exposure being that the operation of planing opens the pores and causes the sap to flow. Many builders rear up their flooring-boards being placed alternately on each side of the rack, with their edges presented outwards, and a sufficient space between them to allow the air to circulate freely. The chief objection to this plan, as it is called, is that the ends of the boards become damp by resting on the ground; but this is
easily remedied by the simple plan of laying a horizontal pole along the foot of the rack to support the lower ends of the planks, and securing it a few inches above the ground, each plank being placed and the distance fixed very accurately both to support and comfort the shrinkage of the boards after they are laid should be reduced to the least possible amount. On this account, also, narrow boards are preferred, instead of seven or eight being laid in a row 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, however, is laid over the principal floor and kind of veneering or finishing. An inch may be considered the least thickness which can be proper for flooring-boards, although, as shown by Batterie, P. C., p. 42, inferior rooms are frequently laid with boards of which three 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 a device for planing the tongueing 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 performed, the tongueing is also done at the same time, and, if required, to cut grooves in them for the purpose of tonguing the joints.

The most common mode 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 a second, 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 plan 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. Boards may be purchased with the tongueing already made, that is, allowing for the movement consequent upon shrinking, 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 fire. The best floors are dovetailed, and nailed at one edge only, the nails being driven in obliquely through the edge, so as not to show at all on the surface. Some workmen insert the dovetail 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 may be laid flat, or it may be laid level by laying a number of thin boards of superior quality, which, if it be desired in order to produce any ornamental pattern, may cross the joints of the under flooring in any direction.

The practice of laying wooden floors above a vaulting of brickwork is alluded to under Fire-Proof Buildings. This is accomplished in various ways, the joints frequently resting upon wooden sleepers laid along the crown of the arches and the upper ribs of the iron girder from which they spring; dwarf walls or piers being raised where it is necessary to provide a level support for the sleepers. Though the spandrels may be filled up with brickwork or concrete, a space for the free passage of air should always be left between the brickwork and the timbers of the floor. Stone floors or pavements are also noticed in the article above referred to. Under ordinary circumstances they are laid upon brick arches, but they are occasionally used upon panes of plate glass or metal, upon which the timbers are occasionally used in public buildings, and have been very highly recommended for the floors of warehouses. The extraordinary strength and durability of this material, which may be obtained in thin sheets, renders it peculiarly fit for such an application; and the facility with which, owing to its non-absorbent character, it may be cleaned with washing, has been found a great recommendation in some of the large departmental shops. In some other respects, and other things are liable to be split. Floors of sheet-iron have been constructed in some fire-proof buildings, the Pantechnicon, for example; but they are inconvenient from their extreme width, and are not sufficiently firm against the boards, 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 force exerted. Any floor thus laid a place to lay it up with brickwork to be straight-jointed, as distinguished from a folded floor.

The heading-joints, or those between the ends of the flooring-boards, have been variously formed and applied, as being 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 by enabling the builder to introduce a current of air among the timbers by means of iron air-hricks, 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-hricks being sometimes concealed by architraves, sometimes being made to appear as a sort of cornice, the air thus admitted is sometimes allowed to enter the chimneys through the jambs for the sake of producing a good draught, while the connection with the atmosphere allows the means of more easy and rapid ventilation of the smoke. In laying these in the ornaments of the ceiling. A method of laying floors which is adopted in some buildings of a superior character, and which is very effectual both in rendering the floor air-tight and in checking the transmission of sound through it, consists in laying a kind of secondary floor of short rough pieces of wood upon fillets nailed to the sides of the joists, about midway between their top and bottom edges, and covering the whole surface of the secondary floor, which is allowed to dry before the flooring-boards are laid, and upon which is sometimes laid a stratum of broken slabs. This secondary floor, or sound-boariding, consists of thick laths, or slips of wood not exceeding an inch or an inch and a half in width, with the joints a little open, that the pugging may key to it like plaster to the laths of a ceiling. In the first-rate houses in which this plan is adopted, the floor is first laid with very narrow boards, often not exceeding two or three inches, between which, at intervals of a few feet, a small opening is left to allow the perfect evaporation of moisture from the pugging. This first floor of narrow boards, which, from their thin width, are incapable of warping to any serious extent, is the only one laid until the completion of the painting, and all that is likely to occasion injury to the boards, are the coatings itself, to which they are left on the floor of thin boards of superior quality, which, if it be desired in order to produce any ornamental pattern, may cross the joints of the under flooring in any direction.
How

In out-buildings, floors or pavements of bricks and tiles are used. In the town of 'Petersham,' 1640, however, they may and 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 the making of walls. But bricks are also laid in having both of the different kinds of pavements. 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 loosercells, patries, dairies, or staple, brick-on-edge pavement laid in dry sand is convenient from the facility which it affords for the escape of fluids split upon it. Some paving bricks are so divided that one brick is having both sides flat, and being only two inches or two inches and a half thick. A small hard kind, called Dutch chinks, is used almost exclusively for brick-on-edge herring-bone pavements, in which the bricks of each course inclined, at 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 and beautiful roadway for Park and Pleasure grounds.

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Proclaimed in 1813, and especially advised him to keep the solemn promise he had given to introduce a general national representation. Unable to oppose a barrier to the king's policy, Humboldt, Beyme, and Boyen tendered their resignation, and Humboldt again retired to Tegel, where he henceforth devoted all his leisure to philosophy, until the death of April, 1832. During forty years he had enjoyed the well-deserved reputation of one of the greatest philosophers and linguists of the age, and the proofs that the rule of the human.

The number of languages, most of them barbarous or half civilized, which he had thoroughly studied, besides the classical languages, was very great. He acquired the most perfect knowledge of the Hebrew, the Arabic, the Persian, and Sanskrit, in a shorter period of years than others would have spent years in learning them. He was equally distinguished for the views he took in comparing the development of languages with the development of the human mind, as well as in comparative grammar; and as a critique of the ideal in poetry, philosophy, and the fine arts, he had few equals in Germany. Humboldt was mediocre as a poet, and it seems he felt his inferiority in this respect, for after having published a few poems, he stopped. He left a great number of poems in MS., chiefly sonnets, most of which were afterwards published by his brother Alexander; but though they are beautifully written and of a most elegant and dignified style, they are not equal to the mental Schiller, in a letter which was written when Humboldt first attempted authorship, speaks thus to his friend:—

"I am convinced that the principal cause which seems to prevent you from publishing is the complete absence of reasoning faculties of your mind over the creating faculties, and consequently the preventive influence of criticism over invention, which always provokes destructive to mental production. But I will not consent to the opinion that only through abstractions in science nothing can be created but by "subjective" activity. In many concerns I cannot call you a genius; yet I must avow that you are a genius in others. For your mind is so powerful a vehicle of genius that at certain times exactly the contrary of all those who are merely conspicuous through their reasoning faculties, through learning, through improvement, through criticism, and which will not stop at the perfection within the sphere of mental creation, but within the sphere of reasoning."

Schiller's judgment was at once frank and correct: the spirit of universal criticism was emboldened in Humboldt, who, with the exception of one large work which he left unfinished in MS., composed only minor works, most of them critical essays, which he published at different periods. The greater part of them was collected by his brother Alexander, and published with the title of Vaskischen Werke, Berlin, 1841, 4to. vol. 8vo.

The principal productions contained in the first volume are—Two Memos about the Iberian Provinces; a Supplement to the Memoirs of the Royal Academy of Berlin, and in Schlegel's 'Jahrbücher'; A Critique on F. A. Wolf's second edition of Homer's Iliad and Odyssey; a sketch of a Grammar and System of the Basque Language; 'Communicating of royal fulness for the publication in the home ministry, but tendered his resignation two years afterwards, and for some time retired to his seat at Tegel, near Berlin, where he devoted his time exclusively to literature, till, in 1813, he was sent as ambassador to Vienna. In this capacity he took part at the Conferences of Prague in the summer of 1813, where, after long negotiations, Austria gave up her neutral position and espoused the cause of Prussia and Russia. During the campaigns of 1813 and 1814 he was in the headquarters of the King of Prussia, Frederic William III. at the conferences of Châtillon; signed with Hardenberg the Treaty of Paris; and after the peace declared the embassy at the courts of minister-plenipotentiary of Prussia, together with Hardenberg, at the Congress of Vienna. The treaty of 1815, through which the King of Saxony lost one-half of his kingdom, which was given to Prussia, was contrived and signed by Humboldt. He continued his diplomatic career at Frankfurt, where he made himself conspicuous through his conciliatory eloquence in the delicate business of dividing Germany among its princes, and afterwards as ambassador at the court of St. James's, which he left during a short time in order to assist at the Congress of Aix-la-Chapelle. In 1819 he was appointed minister plenipotentiary at the Congress of Verona, to represent the policy of the King of Prussia was supported by the states-chancellor, Prince Hardenberg; but Humboldt and the ministers von Beyme and von Boyen tried to persuade the king to be faithful to those liberal principles which he had acquired on a State Plenipotentiary, by the treaty of Vienna, and being the model assisted himself, James's policy, Humboldt, Beyme, and Boyen tendered their resignation, and Humboldt again retired to Tegel, where he henceforth devoted all his leisure to philosophy, until the death of April, 1832. During forty years he had enjoyed the well-deserved reputation of one of the greatest philosophers and linguists of the age, and the proofs that the rule of the human mind.

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"I am convinced that the principal cause which seems to prevent you from publishing is the complete absence of reasoning faculties of your mind over the creating faculties, and consequently the preventive influence of criticism over invention, which always provokes destructive to mental production. But I will not consent to the opinion that only through abstractions in science nothing can be created but by "subjective" activity. In many concerns I cannot call you a genius; yet I must avow that you are a genius in others. For your mind is so powerful a vehicle of genius that at certain times exactly the contrary of all those who are merely conspicuous through their reasoning faculties, through learning, through improvement, through criticism, and which will not stop at the perfection within the sphere of mental creation, but within the sphere of reasoning."

Schiller's judgment was at once frank and correct: the spirit of universal criticism was emboldened in Humboldt, who, with the exception of one large work which he left unfinished in MS., composed only minor works, most of them critical essays, which he published at different periods. The greater part of them was collected by his brother Alexander, and published with the title of Vaskischen Werke, Berlin, 1841, 4to. vol. 8vo.

The principal productions contained in the first volume are—Two Memos about the Iberian Provinces; a Supplement to the Memoirs of the Royal Academy of Berlin, and in Schlegel's 'Jahrbücher'; A Critique on F. A. Wolf's second edition of Homer's Iliad and Odyssey; a sketch of a Grammar and System of the Basque Language; 'Communicating of royal fulness for the publication in the home ministry, but tendered his resignation two years afterwards, and for some time retired to his seat at Tegel, near Berlin, where he devoted his time exclusively to literature, till, in 1813, he was sent as ambassador to Vienna. In this capacity he took part at the Conferences of Prague in the summer of 1813, where, after long negotiations, Austria gave up her neutral position and espoused the cause of Prussia and Russia. During the campaigns of 1813 and 1814 he was in the headquarters of the King of Prussia, Frederic William III.; at the conferences of Châtillon; signed with Hardenberg the Treaty of Paris; and after the peace declared the embassy at the courts of minister-plenipotentiary of Prussia, together with Hardenberg, at the Congress of Vienna. The treaty of 1815, through which the King of Saxony lost one-half of his kingdom, which was given to Prussia, was contrived and signed by Humboldt. He continued his diplomatic career at Frankfurt, where he made himself conspicuous through his conciliatory eloquence in the delicate business of dividing Germany among its princes, and afterwards as ambassador at the court of St. James's, which he left during a short time in order to assist at the Congress of Aix-la-Chapelle. In 1819 he was appointed minister plenipotentiary at the Congress of Verona, to represent the policy of the King of Prussia was supported by the states-chancellor, Prince Hardenberg; but Humboldt and the ministers von Beyme and von Boyen tried to persuade the king to be faithful to those liberal principles which he had
Cesar, Strabo, and other ancient writers. In the countries immediately east of the Rhine, particularly in Austria and the Tamaric (Galicia), the ancient names are exclusively Celtic that the author concludes that both those nations were pure Celts. The Iberians, according to Humboldt, were not the African Berbers, but the ancient inhabitants of Spain, probably the same. The second volume also contains a Memoir on the Limits within which Governments ought to confine themselves in their care for the welfare of their Subjects; A metrical German translation of the 1st, 12th, and 14th of Pindar's Olympic Odes; the 1st, 2nd, and 4th-9th of the Pthian Odes, among which No. 4 appeared first, with a commentary, in the 'Neue Deutsche Monatsberichte' (1811), and No. 41 of Trachtenberg's 'Ueber Hornen' (1797); the 4th, 6th, and 10th of the Nemean Odes; Forty-one Sonnets printed from MS., &c. The contents of the third volume are:—A metrical German translation of the Arachnomachia, first published, Leipzig, 1816, 4to., considered to be a masterpiece; a metrical German translation of the Choruses of the Iphigenia; An Essay on the Drama in France, first printed in Goethe's 'Propylaeen'; A most interesting Memoir on Comparative Linguistic, treated historically, and first printed in the Memoirs of the Royal Academy of Berlin; Forty-two Sonnets from MS., &c. The fourth volume contains:—the celebrated critical essay on Goethe's 'Hermann and Dorothea' (368 pages), which the author first published in the first volume of his 'Aesthetische Versuche,' Bruns- wick, 1814; an account of different Sexes on Organic Nature; Fifty-seven Sonnets from MS. Humboldt's Essay on the Dual (Ueber den Dualismus), Berlin, 1828, 4to., is not in this collection. During the last ten years of his life he was actively engaged in investigating the Malay and American languages; but finding the task above his strength, he abandoned the American languages to his friend Dr. Boaschmann, for whom he afterwards obtained the place of chief librarian of the Royal Library at Berlin, and he devoted his time exclusively to the Malay languages, on which he intended to write an extensive work. When he died, the first volume was nearly finished, and the last eleven leaflets were delivered by Dr. Buschmann, to Alexander von Humboldt, who published it, with a preface of his own, under the title, 'Ueber die Kawi Sprache auf der Insel Java,' Berlin, 1836, 6vo., which attracted the attention of all Europe. The greater portion of this work comprehends investigations of the progress of civilization from the continent of India towards the large islands in the Indian Sea, which he teaches in the courses, 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 impeded publication. If the MS. is in the hands of a scholar, which is very likely, it 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. In the present volume, Dr. Humboldt has collected valuable materials, as well as a collection of rare MSS. and books, chiefly on linguistics, to the Royal Library at Berlin.

(Neuer Nekrolog der Deutschen; Allgemeine Deutsche Rev. 1817.)

HUME, James Deacon, born 28th of April, 1774, at Newcastle in the county of Surrey, was the son of Mr. James Hume, sometime secretary and afterwards a commissary of the customs, and who was nephew of Dr. Hume, bishop of Salisbury. The subject of this notice was sent when very young to Westminster School, and in that establishment received during the head masterships of Dr. Smith and Dr. Vincent, a liberal education.

In 1790, when at the age of sixteen, Mr. Hume was appointed to a clerkship in the Custom House, where he soon became conspicuous for that energy of character which accompanied 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 expressed, that a man should never content himself with performing merely his own duties, but all his powers should be exerted in the public service as far as his abilities would allow. He showed alacrity in assisting every one requiring assistance, and in extending to the utmost his ability the field of his usefulness. At the important event of the great fire that occurred on the 29th of June, 1790, Mr. Hume undoubtedly secured his own advancement in life, and attained to his deserved high reputation.

In 1798 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 part of a house in York Street, for which he rented a considerable extent of land, and commenced practical farming upon a large scale, not however neglecting his official duties, but giving daily attendance at his office, for which he allowed his landlord, at a small addition, to pay him for the privilege of entering the premises before daylight, returning to it after dark. He was always deeply 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 health had come to be highly important, and he obtained, by 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 one simple code the many hundreds statutes (upwards of 1500), often contradictory 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 it was as well a commercial as a commercial work. No other man could its performances have been 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 inward upon his bodily powers which was visible in the latter years of his life, and which heretofore could have been 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 of his studies spent working through the hours of the night and far into the morning. Of the value of the work thus performed it is hardly possible for any one to form an adequate estimate who should not have been practically acquainted with the condition of disorder that previously accompanied an important branch of the public business, and into which the acts prepared by Mr. Hume introduced clearness, harmony, and regularity. In the accounts of the customs, which he afterwards wrote, he has expressed his keenest admiration for the efforts of the late Dr. Hume's direction, and passed in 1826, everything was preserved that it was desirable to retain, while all that had become worthless in the many hundreds of repealed statutes was discarded. So intimate 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 application, and the practice of our tribunals upon this branch was frequently contradictory.

So sensible were the ministers by whom this work was intrusted to Mr. Hume of the ability with which it was performed, that he was permitted by the department to retire in connexion with the sum of 4000L. 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 thereby cleared of every question of importance the present condition of the department at 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 performance of the important duties thus intrusted to him, Mr. Hume used the same degree of zeal and intelligence which he 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 a 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 treaty by Great Britain to Parliament, he was expressed his lordship's full approval of his long and faithful services, accompanied by their regret that the public service would be deprived of his retiremént. He had been deprived of his duties by circumstances connected with the mercantile system of this country.' The regret thus expressed was in effect uncalled for, as on all occasions, up to the close of his life, on which his advice and experience were desirable, they were freely sought and con-
umbated; and it is probable that at no time during his active career was he able to render more essential service 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 1849, evidence which, having been frequently quoted with commendation 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 stupor of an apoplectic character, and two days thereafter died, on the 18th of January, 1849, 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 essays.

His earliest papers upon subjects connected with commerce, which appeared from time to time in the British and Foreign Review, are of these, and upon the subject of mercantile law, in which he afterwards expended his labours 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 many small compass, 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 considered in this world, was ever attended 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 affections to all who enjoyed the privileges 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 upon 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 in the air is capable of containing depends upon the temperature; when the latter is low at any part of the earth's surface, the air may be saturated with moisture so as to be incapable of holding any more. Mr. Hume has shown that the quantity of moisture in a given volume of air will then be small. If the temperature be increased, the atmosphere, becoming 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.

Due, P. G.; Rarx, P. C.

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 in any given volume is thereby reduced; and, as a general law, 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 remarked by travellers, but the quantity of moisture in the different strata is, from local influences, subject to many irregularities. The temperature of the lower strata of the atmosphere diminishing as the altitudes of places on the earth decrease in volume of air, and if the atmosphere be 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 fresher with increase of altitude, and, in the tube of air through which the air is slowly ascended, 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 dissipated. On the contrary, when the mean density of the atmosphere diminishes in length, the clouds descend; and arriving near the earth, they enter a region in which the atmosphere is at or near the state of saturation; when, consequently, the vapours are easily precipitated. Biot observes, on this subject, that the descent of the mercury is a more certain prognostication of rain than its ascent is of fair weather; the ascent of the clouds in consequence of an increased density of the air not being necessarily accompanied by the dispersion of the vapours 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 air is filled with 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 humid, and the eye of the experimenter, if assembled in a close 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 absorbed in their leaves; 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 calculated the quantity of garden mists, which fell 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 in summer weather, he weighed it, and 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, and one foot in width, when saturated with water, contains, on an average, as much as a foot of water, which is about one inch 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 wet body 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.

**HUMIRIACEAE** is a natural order of plants belonging to the family Humiriaceae of Polypetalous Euphorbeae. It has the following essential character:—the calyx is in 5 divisions; the petals alternate with the lobes of the calyx and equal to them; the stamens hypogynous, 4 or many times as numerous as the stamens, free; the anthers discoid, longitudinally connate, extended beyond the 2 lobes; the ovary superior, usually surrounded by an auricular or toothed disk, 5-celled, from 1 to 2 suspended ovules in each cell; the style simple, the stigma lobed; the fruit drupaceous, with 5 or fewer cells; the seed with a membraneous integumen, the embryo straight, oblong, lying in flabby albumen; the radicle superior. The plants belonging to the order are trees or shrubs abounding in a resinous juice, with alternate, simple, coriaceous exstipulate leaves, and axillary coryls of flowers.

The affinities of this order are not well made out. In their albinomous sea-quantities of skidder embolus they agree with Subulaceae, as also in their balsamic wood. They resemble Malacca and much in habitat and in their fructification, but the authors and seeds of Humiriaeae differ very much from those of Meliaceae. Agreeing in the general law, 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 remarked by travellers, but the quantity of moisture in the different strata is, from local influences, subject to many irregularities.

The temperature of the lower strata of the atmosphere diminishing as the altitudes of places on the earth decrease in volume of air, and if the atmosphere be 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 fresher with increase of altitude, and, in the tube of air through which the air is slowly ascended, 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 dissipated.
foet in height, with ovate oblong leaves half-clasping the stem, which becomes in maturity narrower and 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 results from the wound. A house in which this tree is thus wounded becomes hard and transparent, and when burnt affords an agreeable odour. The negroes and natives of Guyana use the bark in slips for the purpose of flameaux; they also use the wood for building their houses. We have no account of its composition of this resinous juice, but Ashtel suggests that it might be used as a substitute for the Peruvian balsam. The Creoles call this tree "Red-wood," on account of the colour of the wood and also because of the mainly of Hellicera and Sncoclytis, yield resinous juices.

Lindley, Natural System; Burnett, Outlines of Botony; Don, Gardner’s Dictionary.)

Hungary. Among the kings of Hungary there are three of the name of Andrew, or Andrews, who deserve a short notice.

Andrew I., the son of Prince Ladislaus the Bald, and the fourth king of the house of Arpad, reigned from 1046 till 1061. His predecessor, King Peter, in 1045, had offered Hungary as a fief to the Emperor Henry III. of Germany; but Andrew refused to take the oath of vassalage, and after a prolonged war he proclaimed himself king, 1052, through which all feudal ties between Hungary and the empire were abolished. During the reign of this king the movements of the Hungarians and the Bulgarians were succeeded in introducing the Christian religion throughout his kingdom. Andrew fell in battle with his brother Bela, who succeeded him on the throne.

Andrew II., Hierosolymitanus, was the son of King Bela III.: he succeeded his elder brother Emmeric in 1205, and reigned till 1235. During his long reign Hungary was shaken by disturbances and civil and foreign wars, caused by the reckless and ambitious character of Andrew, whose passions however were more violent than strong. Previous to his accession he waged war with his own brother Emmeric, and raised a numerous army. They were encamped in sight of the city, and were long kept in suspense. At last it is reported that the partisans of Andrew 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 Emmeric carried Andrew from the midst of his own army, and kept him in prison till 1210. This event only ended the troubles of Hungary. Andrew was brought before him, and appointed him guardian of his son Ladislaus, who was a minor. After Emmeric’s death, Andrew seized the royal authority and reigned in his own name till 1235, and then died, in 1235, in Hungary, so that Andrew became legally possessed of the supreme power which he had usurped. Andrew was a slave to his beautiful but haughty queen Gertrud, a princess of Memnon, whose conduct became so unseemly that the principal Hungarian nobles conspired against her life, and during the absence of Andrew in Galicia, in 1213, they surprised her and put her to death. The conspirators were headed by the Magnate Buncu, whom the queen had mortally offended; for in order to take revenge for a slight offence which she pretended to have received from Buncu’s wife, who was famed for her beauty and virtue, she prevailed upon her 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 trivial, and he returned in 1222: thence he was called 'Hierosolymitanus.' Andrew took an important part in the Byzantine state. He married Theodora Constantincou, Peter of Courtenay, in 1217, the crown of Greece was offered to Andrew, who however declined it, and, in 1218, made a treaty of alliance with Theodore Lascaris, the ruler of Cyprus. In 1222, he married his second son in marriage to Andrew’s eldest son Bela. When Andrew 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 nobles was so great that in the diet in 1229, which Andrew convoked immediately after his return, they forced him to subscribe the "Aurea Bulla," or "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 still considerably diminished. This was a mark of the political 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 Andrew II., was crowned King Charles 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 Hungary, with which he had previously been invested by his father the Emperor Rudolph I. of Germany; whereupon the two princes joined against Charles Martel, Prince of Naples, who founded his claim to the Hungarian crown upon his descent from Maria the sister of the last king of Byzantium. Charles Martel having died before he was able to prepare an expedition against Hungary, his case was taken up by his son Charles Robert, who, having found support among a powerful faction of the emperor, made his claim to the Hungarian crown. He entered that country in 1300, and took the field against Andrew. The failure of the royal arms against the invaders of Hungary, was accompanied upon the 20th of May, 1301, the death of Andrew. Thus, 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 or of the Savoy, that reigned over Hungary during nearly a century.

(Mailath, Count of, Geschichte der Magyaren; Pray, Historia Regnum Hungaria.)

HUNTINGTON, ROBERT, D.D., was born in February, 1836, at Deobryt, 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 Bristol in 1842, he entered Merton 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 1863; and, having then applied 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 1877, and Egypt in 1880, and again in 1881, besides making an unsuccessful attempt in 1878 to reach Palmyra. He returned home in 1884, and continued his studies in the same way, so that he accumulated the degrees of bachelor and doctor in divinity in June of the following year. In the latter part of that year he was prevailed upon with much reluctance to accept the pension of £400 a year; and he was presented by Sir Edward Turner to the rectory of Great Hallingbury in Essex; and while he there married a sister of Sir John Powell, one of the justices of the King’s Bench. He seems still, however, to have feltuntiring in what 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; and, although he had some years before refused the bishopric of Exeter 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, ‘The Hieroglyphics of the Porphyry Pillars in Egypt.’ The writer of his Life in the ‘Biographia Britannica’ states that some of observations are printed in Ray’s ‘Collection of curious Travels and Voyages,’ 2 volumes, a work of which the first part was in marriage to Andrew’s eldest son Bela. When Andrew 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 nobles was so great that in the diet in 1229, which Andrew convoked immediately after his return, they forced him to subscribe the ‘Aurea Bulla,’ or ‘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 still considerably diminished. This was a mark of the political 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.

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(Mailath, Count of, Geschichte der Magyaren; Pray, Historia Regnum Hungaria.)
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,
Greek and Latin inscriptions, of all of which he hoped to
give a true account; and probably be able to profess to have
received by the English public the successful accomplish-
ment of the modern journey to Palmyra, which was
achieved by some gentlemen of the faculty of medicine
and of which a full account was given in the Philosophical
Transactions' for 1665. Bay's book may have been printed in
the latter part of 1692, though not published till May,
1693, for the first number of the journal for that month
is dated.

Dr. Huntington is principally remembered for the numer-
ous 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 200£. 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 1654 by Mr. Tatton from one of
the ruins near Palmyra which had been purchased 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 William Cureton, keeper
of the oriental manuscripts in that establishment. Huntington's
letters, which are addressed to the Archibishop of Mount Sinai,
contain inquiries about the MS. of St. Ignatius; and the same earnest
inquiries are made in his letters to the Professor of Hebrew.

There is a Life of Bishop Huntington, in Latin, by Dr.
Thomas Smith, at the end of which are thirty-nine of his
Letters, &c., published in 1801, at London, in 1704; and
he also subjoins an article in the 'Biographia Britannica.'

HURA, a genus of plants belonging to the natural order
Euphorbiaceae. It has noneesecious, ameneaceous flowers; the
stamens are shorter than the calyx; the truncaceous; the stem;
united into a solid column; the pistillaceous flowers with the
style simple, and the stigmas with 12-18 rays, and the capsule
with 12-18 cocci. H. crpephana 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 corolae, accuminate, entire or very
slightly toothed, stalked, smooth, coriaceous leaves, with simple
veins passing from the midrib to the margin in a curved
direction, within a quarter of an inch or so of each other,
and connected by numerous oblique veins; large, ovate,
leafy, deciduous stipules, and petioles as long or rather longer
than the blade. The fruit is a 2-gland a一天 that
tree is a depressed umbilicate woody capsule, about
the size of a muddling apple, from 12-16 furrows which
separate into as many cocci, each of these separates into
2-3 segments with gouty teeth when dry and fully ripe. The noise the fruit makes during this process
has obtained for the tree its common names. The juice of the plant, like that of the allied genus Excerraria (Eccceraria,
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.)

HURRAH, also called Hurrar and Adhuri, is a country
with a large commercial town in the eastern part of Africa,
and is situated midway between the Horn of Africa and Ankor, the cap-
ital of Saba [Amana-
cia, P. C. S.] and the harbour of Burmah. 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-
tounts 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-
rrounded by a wall of stone and mud, which is about twelve
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- or resembling those in Shoa. The emir and the prin-
cipal men have houses but two stories high. The houses are
said to be many mosques within the town, forty-four of
which are the abodes of learned men. The town is well sup-
plied with water from numerous springs in its vicinity. Close
to the town is a river called Samhi.

The inhabitants are rigid Mohammedans, and pay strict
attention to the fasts and ceremonies enjoined by that religion.

The inhabitants of Hurrar are said to be hospitable and
kind, and those who are of the genteel sort are not
averse to the use of tobacco and wine. They have some
unusual attire, consisting of a white or black veil, and a
robe resembling a nightgown, which they wear in the
daytime.

Hurrar may certainly be considered, for that country, a
great commercial town. Kaffars arrive there or depart at
all times and seasons. They have a yearly trade of 3000 bales of
cloth and Burbruz and Zeila, which two last-mentioned places
may be considered as the ports of Hurrar. Three kaffars
visit Burbruz between the months of October and March. The
exports consist of 2000 camels. They export coffee, jowari, guava, ostrich
feathers, gum, myrrh, and urr; the last-mentioned article is
said to denote appearance, and is used by the Arabs as oint-
ment for the body. It is also made up into cakes, which are said to be
very palatable.

They also export Burbruz slaves, both male and female,
and receive in return blue and white coarse cloth, Indian
piece goods, European prints, red cotton-
yarn, burlas, zinc, copper-wire, frankincense, and some
smaller articles. There are also annually three kaffars to Zeila. The
kaffars make a trade of importing from Zeila, chiefly blue cloth, red
cotton-yarn, &c., and receive in return slaves, mules, and
horses. Other kaffars trade between Hurrar and Arusich
and Chercher, two towns or encampments of the Galia, situated
west and south-west of Hurrar; the articles of export and
import are imperfectly known.

The climate of Hurrar is said to be similar to that of Shoa,
but not quite so cold. The language bears an affinity to the
languages of the North Arabian district, and the character
is used in writing. The ruler of Hurrar has the

Barker, Report on the probable Geographical Position
of Hurrar, in London Geographical Journal, vol. viii.; Christo-

...}

HUSKISON, WILLIAM, was born March 11, 1770, at
Birch Moreton Court, Worcestershire, where his father
occupied an extensive farm. The family had long been
situated in that part of the county, and had been
in the possession of a moderate landed estate on which
they resided. On the death of his mother, in 1774, his father
removed into Staffordshire, married a second wife, and
resided upon his patrimony until his death in 1790. He had alien-
ated a considerable portion of his property in order to make
provision for his younger children. The entailed property
descended to the subject of the present notice, who cut off
the entail and disposed of the landed property altogether.

In 1788, when in his fourteenth year, William Huskisson
was sent to Paris, at the request of his maternal uncle, Dr.
Gren, physician to the English Embassy. Dr. Gren was on
the terms of friendship with D'Achabie, the celebrated
raconteur, who was afterwards known as the Encyclopædist. William Huskisson, as
natural to a young man, became an enthusiast in the cause of
the French Revolution. He was present at the taking of
the Bastille in 1789, and became a member of the Société

...
Huskisson, the duke laid it before the king. In the correspondence which ensued it is evident that the Duke of Wellington was not disposed to support Huskisson. He had once before voted against his ministerial colleagues, in opposing, in 1822, Lord Londonderry's resolutions for the protection of the agriculturists; but at the request of Lord Liverpool, the prime minister, he remained silent. The agitation of Mr. Huskisson was followed by that of Lord Palmerston, Mr. Grant, and several others who had belonged to the political system at what was called "Mr. Canning's party." In the session of 1829 he appeared on several occasions as a formidable opponent of some of the measures of the government, and, for his death so soon afterwards, there is every probability that he would have been re-elected. Panic, commercial principles were held by him in common with them, and in his general views he was approaching 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 relieving the Jews of their disabilities. He was 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.

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 in a pamphlet entitled 'The Question concerning the Management of the Bullion of the Realm Examined,' which was published in 1810. In the debates on the corn laws, in 1814, he supported the system of protecting agriculture by high duties, on the ground that commerce and manufactures were protected by them. The system was one of artificial restraints. He was at that time merely for free trade in the abstract. He alluded to the possibility of import corn becoming one-fifth, instead of thirty-fifth of our consumption, if proper means were not taken to encourage the home cultivation. He was averse to the country being dependent on foreigners, and thought such circumstances not to be the means the object of its. He proposed a sliding scale of duties, according to which the duty would be 25 s. 8 d. when the average price of wheat per quarter was 65 s.; and as the price rose the duty would fall, so that at 68 s. there would be no duty at all. Corn from the colonies he would have admitted at one-half the rates of British corn. The question was postponed to the following year, and he supported the corn-bill of 1815, and thought that less than 65 s. 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 a tax of 2s. 6d. per quarter, which wheat should again reach 70 s. the quarter, a fixed duty of 15 s. should be laid on the import 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 however he acknowledged that the policy of the corn laws must be viewed in the light of 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 68 s. the quarter. In 1819 he was appointed a member of the Committee for the mines. 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 1822 Mr. Wallace and Mr. Robinson (now Earl of Ripon) had taken some preliminary steps for relaxing restrictions on commerce; and those efforts were carried on more actively and on a larger scale by Mr. Huskisson. In 1819 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 shipping, provided that similar privileges were given to British shipping in the same state. He aban-

Hus,

Hus.
he was attacked very generally, both in and out of parliament, for his departure from the antient commercial policy of the country. His speeches in Parliament in defence of his measures are his best; and his expositions of the commercial code are still among the most interesting. H. Parnell (Lord Congleton) 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. . . .

He did no more than maintain the balance between the free-traders and the protectionists in taking a duty of 50 per cent, as the standard of regulation; and hints, that had he ever thoroughly espoused the cause of free trade, he had shown that he had the political power to advance it. He had of making improvements in his plan of 1825. (Financial Reform, p. 78.) But even the reforms which he did effect excited great clamour against 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 1830 Mr. Huskisson left London to be present at the opening of the Liverpool and Manchester Railway, on the 16th of September. When the train reached Parkside, near Newton, he got out of the carriage, with many others, and had just been speaking to the Duke of Wellington, when an alarm was raised on the approach of an engine on the other line. Mr. Huskisson attempted to regain his seat, but fell to the ground at the moment the engine passed and was dashed to death. He was interred in the house of the Rev. Mr. Blackburne, of Eccles, but the shock to the system was so great that, after enduring great agony with much fortitude and resignation, he died at nine o'clock in the morning. At the funeral Mr. Huskisson's reputation and influence of the mercantile classes of Liverpool remains 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 from office in 1787, he entered upon the receipt of one thousand pounds a year. At that period his power was increased 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 Hoyton, the salary 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.)

HUTCHINSIA. [Thalaspidea, P. C.] HUTTON, WILLIAM, was born at Derby, of poor parents, in 1765. By fine 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. This may be done by his father, for his 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 1786 he bought an old worn-down press, and taught himself the art of bookbinding. In 1790 he walked to London and back to purchase a few books, at this time, of the year. He commenced attending the market-day, and here he rented a shop at twenty shillings a year, and opened it for the sale of books. In his biography he says: 'During this rainy winter I set out at five every Saturday morning, carrying a burthen of from three pounds' weight to thirty, opened shop at ten, starred 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-porridge prepared by the bellman, and a loaf of bread, which my mother'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 1790, after having twice visited Birmingham in order to see the chances of success which the place offered, he on one 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 styles that he would not always pay in time, and at last, his shillings a week covered all his expenses, and at the end of the first year he had saved 30l. Fortune continued to smile upon him, and in 1796 he married. In 1791 his property was estimated at 200l. a-year, and he purchased a house at Birmingham in that year, but after great difficulty he succeeded in recovering 500l. from the county. He now relinquished business in favour of his son. He had filled successively all the offices of the local society, and he purchased the 'History 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,' 1788; 'History of Blackpool,' 1784; 'Battle of Bosworth Field,' 1789; 'History of Derby,' 1790; 'The Barbers, a Poem,' 1793; 'Edgar and Elfrida, a Poem,' 1793; 'The Roman Wall,' 1801; 'Remarks upon North Wales,' 1801; 'Tour to Scarborough,' 1803; 'Poesies, chiefly Tales,' 1804; 'Trip to Coatham,' 1808.

Mr. Hutton died September 20th, 1815, a few days before the completion of his ninety-second year. In 1810 his daughter published 'The Life and Letters of Hutton, Statemaker of Birmingham, and the History of His Family: Written by Himself.' This work is one of the most entertaining and instructive pieces of autobiography in the language. An edition of this work was published with English Miscellanies. This edition contains some interesting notes by Catherine Hutton, Mr. Hutton's daughter, who was then in her eighty-fifth year; and passages of a personal nature from the original being a fragment of a larger work in the form of a letter to a gentleman of the name of William.

HYBRID PLANTS. [Sexes of Plants, P. C.] HYDATICA, a genus of fossil plants (probably aquatic) from the coal formation. (Aris.)

HYDE, SIR NICHOLAS, was appointed chief justice of the King's Bench in 1626. He was the uncle and preceptor of the first Earl of Clarendon, whose mind he had great share in forming, by proposing daily to him legal questions for his amusement, and regretting his failure in not being able to make him a peer. The court refused to allow to the prisoners their habeas corpus, and inflicted fines upon them of considerable amount. This conduct (Sir Nicholas Hyde's curious apology for which was the cause of the Roman Catholicogh, a bill to which he was not a party) was now voted by the long parliament a delay of justice. He died at his seat (Hinton Lodge), in the parish of Catherington, Hampshire, on the 28th August, 1681, aged 69.

Whitelocke, his colleague on the bench, and political opponent, records that 'the cause of his death was a hot fever, rendered incurable by reason of an imposthume breaking in his head; and that he lived 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 beautiful full-length marble effigy of him still exists in the church of St. Katharine, 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 memoral wanderings was concealed for a night at the house of one of Mr. Hyde's tenants. But as this tenant was too hot-headed a royalist to be safely intrusted 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. The next day he having supplemented his sister's share of the house by 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-
Hyde's cousin Colonel Gounter, himself an actor in the casts. This manuscript now deposited in the British Museum, and contains the only authentic account of the escape of the king. There are notices of it in Jesse's "History of the Stuart"; and in Parry's "Account of the Coast of Scotland". In 1840, De Lacy, in "The Restoration," be, the only son of William John Grange, the negotiator between General Monk and Charles II. for the restoration of the king; and died in 1892. His granddaughter married Mr. Root, a Somersetshire gentleman, in whose family the estate still continues.

HYDRASTIS. (Warner, P. C.)

A genus of plants belonging to the natural order Umbelliferae, and to the sub-order Orothoraceae. 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 sliform, the carinal and lateral ones usually obsolete, and the two intermediate ones joined. The species of this genus are generally bog-herbs; but few of them are under-shrubs. The umbel is single, surrounded by a few-leaved involucre. The flowers sessile or pedicellate, white.

Of 90 species of plants have been referred to this genus. It is not however improbable that a more attentive study of them will lead to the distinction of other genera amongst them.

This plant has peltate, orbiculate, double crenate leaves; the umbel capitata, of 5 flowers, often proliferous; the fruit smooth. This plant is a native of Great Britain and throughout nearly the whole of Europe, in marshy boggy places, and in the rocky crevices in the sides of mountains. It is called "Pennywort", on account of its leaves lying flat on the ground and having the size and form of a piece of money. It is also known by the names of "veiled-pennywort", "white-rayed", "sluice-wort", and "sheep's-lane." These latter names it has obtained on account of its being supposed to produce the rod and other diseases in animals that feed on it. This is, however, an error, as this plant will not produce disease in animals, but it occurs in damp moist situations, where animals that feed are likely to be attacked with rod and other diseases. It is in this way that other marsh plants, as the species of Drosera and Pinguicula, have been supposed to cause disease in sheep and oxen.

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. Ascotiana is said to be used in India as a diuretic and occasionally as a culinary vegetable. H. umbellata is recommended by Martin as a diuretic for the same purpose. This is the only question that is not stated. The fresh juice acts as an emetic. It is said to possess an aromatic odour and an agreeable taste. The species of Hydrocotyle are easily cultivated; they must all be kept moist, no water whatever being given; some kinds should be grown in pots placed in pans of water.

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

HYDROCYANIC ACID. (Frassic Acid, P. C. S.)

HYDROSTATIC BED. (Bentladel, P. C. S. P.)

HYDROMETRY is that part of natural philosophy which relates to the determination of the humidity 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 atmosphereReadable, precisely 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 vapour is, at a given temperature, 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 used for determining the absolute 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 tension or elasticity of watery vapour corresponding to every degree of Fahrenheit's thermometer, the temperature being 0°, has been determined by Dr. Dalton for the purpose of reducing 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 such tensions is published in the fifth volume of the 'Manchester Memoirs.'

Previously to stating the manner of determining the relation between the indications of an hygrometer and the quantity of aqueous vapour in respect to temperature, it will be proper to notice the following circumstances:—When an hygrometer, like that of Sauasseur or De Lec (Hygrometers, P. C. S.), is introduced in a close vessel, or in any part of space fully saturated with aqueous vapour, it is observed that, whatever be the temperature, the index points to the same graduation; from which it may be inferred that equal quantities of vapour have been absorbed by the material (hair or whalebone) of which the instrument consists, notwithstanding the difference of temperature. In fact the vapour in the vessel, or spaces, is in such a state that the presence of a material having the least affinity for water, is sufficient to produce a diminution in theelasticity of the material: the quantity thus absorbed is necessarily constant, unless the affinity undergo some change by a change of temperature; but each material of which the instrument is made is not sensibly altered by such change within the limits of the usual thermometric scale. When the vapour which the hygrometer is introduced is not completely saturated with water, the quantity of water absorbed by the hygrometer is limited by the power of the latter to absorb the precipitated moisture: that power diminishes in proportion to the quantity received, so that the affinity of the material for water ceases to act when it is equivalent to the pressure which the vapour can support without becoming liquid; and the elongation of the hair or whalebone then ceases, or the index remains stationary on the scale.

In order, then, to determine the law according to which the affinity of the hygrometric material for water diminishes as the precipitated water is absorbed by it, or, in other words, to find on the scale of the hygrometer a number of points corresponding to any given elasticities of the vapour, Gay Lussac put water into a vessel of glass; and, having determined the elasticity of the vapour rising from it, he suspended from the upper part of the vessel, a delicate and very sensitive barometer, the circumference of the graduated ring which served as a scale; this point thus became an indication of the elasticity of the vapour. Experiments of the like kind being made with vapour of equal temperature, but in different states of elasticity, between those which correspond to extreme dryness and complete saturation, there were obtained so many points on the scale of the instrument as indications of the elasticities of the vapour.

From the results of these experiments M. Biot found, by interpolation, a table of the elasticities of vapour for every degree of Sauasseur's hygrometer, the temperature being 0°, the centigrade scale being adopted (Gay Lussac, Table of Hygrometers, liv. i. ch. 13); but the elasticities or tensions would be more conveniently expressed in terms of the elasticity at the point of complete saturation, which is then represented by unity.

The numbers in the table are formed from the observed tensions at a constant temperature equal to 50° (Fahr.) and it has been supposed, that the index of the hygrometer stands constantly at 100° when the material is exposed to vapour in the state of maximum tension whatever be the temperature, that the index should stand at one point on the scale when the tensions of the vapour have the same proportion to...
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 errors 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 volume by variations of pressure as are suffered
by permanently elastic fluids, determined, by subsequent ex-
periments, the volumes of the vapour produced by a given
weight of water at given temperatures and under given atmos-
pheral pressures; and thus, consequently, obtained the quan-
tities of water in a given cubic inch, 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 Encyclopedia'.

This formula is

\[ G = \frac{447}{4} + t \]

in which \( G \) is, in grains, the quantity of moisture in a cubic
inch of vapour at the temperature represented by \( t \) (Fahren-
heit's scale), \( P \) is the elastic force of the vapour at the same
temperature, and \( B \) is the height of the barometrical column
in inches at the time of the experiment. It agrees nearly
with what has been obtained by DALTON, from experiments on
the state of the thermometer at the dew-point [J. of Eco-
nom. P. C.], the height of the mercureial column in that
result being 30 inches. From this formula, the temperature \( t \)
being 30 inches, and \( P = 0.375 \) (from DALTON's table of the elastic force of vapour corresponding to
that temperature and that density of the air), we have

\[ G = 0.02477, \]

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
corresponding to the observed degree of SAUSURO's hygrom-
eter may be obtained on multiplying that value by the
number in BIOT's table corresponding to the observed degree
and dividing the product by 100; this division must be made
because, in that table, 100 represents the elastivity 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 SAUSURO and
DE LEO, may be found in the following manner: the instru-
ment is to be placed under a receiver in which is a certain
quantity of dry cesitic 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 indicator 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
containing moisture, with the material, when the material
will expand to the great extent permitted; the place of the
index is then to be considered as the point of extreme
humidity, and is usually indicated by 100.

The lower consists of a glass tube bent so as to
form two equal branches parallel to each other, and each
terminating with a hollow ball in which is introduced sul-
phuric acid, coloured. One of the balls is covered with
cambic, 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
that 4 grains of water (calculated to the volume of 1 ounce
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
the temperature expressed by \( x \times 0.000, \) or 16,000 degrees of the
instrument; and consequently that, at the temperature of the
wet air, the atmosphere contains a quantity of moisture
equal to that of the weight of one 4 grains.

The scale between the points of extreme dryness and external moisture
being divided into one thousand parts. (Textual '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,
the expression of the forces in a given volume of air is thus
saturated with moisture may be found. For if \( V \) represent
the given volume of dry air, \( V' \) the volume, when saturated,
and \( B, \) in inches, the height of the barometric column;
then the whole force of the air under the increased volume

\[ V = V' \]

Now \( P \) 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 vapour will be expressed by \( F + P \);
and this being made equal to \( B, \) the pressure of the atmos-
phere, 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 tem-
perature at which moisture begins to form in the atmosphere
may be found from DALTON's formula \( E = \frac{4}{10} M (F - P), \)
in which \( E \) is the number of grains evaporated in one minute
from the surface of water in a cylindrical vessel 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 annual temperature at the place (50° Fahr., for Great
Britain; 60° for tropical climates) and \( P \) the elastic force expressed as
the moisture begins to form: \( M \) is, in grains, the evaporating
force in an atmosphere supposed to be perfectly dry; and
DALTON has given a table of such forces for different tem-
peratures, and for moisture being at rest, after the wind
had ceased its motion. In the table, the temperature being 212°,
the height of the barometrical column 30 inches, and the wind blowing
moderately, the value of \( M = 154; \) and substituting this value in
the formula, we have \( F' = F - 1 E. \)

The mean annual evaporation in Great Britain is 0000456
inches or 0.0116 grains per minute; this last number being
multiplied by the area of a circle 6 inches in diameter, gives
0.0232 grains per minute (16 E) for the evaporation in
Great Britain, and 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
\( F' = 3103 \) inches. Substituting in the above formula for \( G \)
this value of \( F' \) in place of \( F, \) and 30 inches for \( B, \) we get
00205 for the number of grains of moisture in a cubic inch of
air corresponding to the elasticity \( P \); the number cor-
responds to 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.

HYGOMAS, or scales from Hygrometrica, in reference to its twin
leaflets, a genus of plants belonging to the natural order
Leguminosae. It has a calyx furnished with two bracts
at the base; the tube turbinate, coriaceous; the limb 4-5 parted,
diadelphous, the lobes sometimes united in pairs, the
sepal nearly equal, glandular; 10 stamens distinct, inflated
in the middle; the style filiform; the legume woody, oblong,
many-seeded, containing fecula; the embryo straight. The
species are trees, with laticiferous leaves, and coryls of white
or yellow flowers.

H. Courbaril, Locust-tree, or Gum-Annine Tree, is an oblong
ovate leaflet, unequal-sided, and unequal at the base, ending
in a long point; with the legume oblong, compressed, yel-
wobish, 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 substance, which is sweet
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
Gum Annine or Gum Animal. This resin resembles amber,
and is very hard, and sometimes containing carbonaceous
lumps imbedded in it, which remain in a perfect state
of preservation. It burns readily, emitting a very fragrant smell.
Dissolved in alcohol it renders the wine of a dark kind of
varnish. According to Lindley, this resin is called
Jatnha, Jatkh, or Copal, and in Minas Gerais Jatoba.
Courbaril is the name of the tree in some parts of South
America. In countries where this tree grows the resin is
used medically, 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 dyspepsia.

Dissolved in spirits of wine or oil it is used as an emulsion in rheumatism. Internally, it has been much employed 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 curnudes 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, particularly for cogs. 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 Hypholoma are described, but of them positively little is known.

(Doen. Gardener's Dictionary; Lindley, Flora Medica.)

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 (Fussor, P. C.); by Berkeley into six tribes. Those of the latter are, Pilati, Clavati, Miroti, Cupulati, Tremolinit, and Sclerotiacei.

The tribe Pilati contain the following British genera:—

*Agaricus*, in which the hymenium consists of plates radiating from a common centre, and with short or long, from the interior, composed of a double closely connected membrane, more or less distinct from the piebus: the veil is various or absent. (*Agaricus*, P. C.)

*Cantharellus* has the piebus furnished below with dichotomous, radiating, branched, subparallel folds, not separable from the flesh, sometimes anastomosing or obsolete.

*Molcinus* has the hymenium velvety, or simoom-pileate; the folds not distinct from the flesh of the piebus, forming unequal or fithickorous pores. (*Molcinus*, 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 a cary or are; on the outer surface.

*Dedalus* has the hymenium composed of anastomosing gills, or numerous elongated pores formed out of the cory substance of the piebus.

*Polyporus* has the hymenium concrete, with the substance of the piebus consisting of subrotund pores with their simple dissections.

*Bolus* has the hymenium distinct from the substance of the piebus, consisting of cylindrical separable tubes, with oblong sporela. (*Bolus*, P. C.)

*Gyromitra* has the hymenium formed of a distinct substance but concrete with the fibres of the piebus; the tubes at first wart-like, somewhat remote, closed, radiate-fimbriate, at length approximated, elongated, open. This is the most perfect of the hymenium of the same substance as the piebus, composed of free spore-like processes.

*Stielleichtas* has the hymenium somewhat distinct from the piebus, composed of irregularly disposed, curved, and gyrose amelante teeth.

*Irpes* has the hymenium concrete with the substance of the piebus, torn into distinct spines, disposed in rows or in a reticulated manner, their bases connected together by lamellae, sinuous, or poro-foveal; the saci slender, situated only on the toothed processes.

*Radius* has the hymenium tuberculated; the trabes serrated, resembling papille or rude somewhat angular spines, more or less obtuse, distinct or irregularly fasciculate, the inner substance homogeneous with the receptacle; the saci occupying indifferently all parts of the hymenium.

*Phallus* has the hymenium homogenous and concrete, with the piebus smooth, venoso-rugeous, wrinkles interrupted, disposed irregularly, straight or flexuous, bearing saci all over.

*Thelephora* has the hymenium homogenous and concrete with the piebus, even or papillate, the whole surface bearing saci.

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.
D. mucronatus 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. The species are known in arts and medicine. 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 lime. It has been hitherto used in a soft sponge state. Many other species of Polyergus may be used for the same purpose. The Laplanders also use them for making the actual cautery in the same way as the Japanese and Chinese use them. When they have made a wound 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 the skin, when it acts as a counter-irritant. P. officinalis is a cathartic. P. mucronatus has a pleasant smell. Some of the species secrete acids, and boletic, fungic, and axillary acids have been obtained from them. P. sepium is the largest of the British fungi, weighing sometimes as much as thirty pounds. P. destructor 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 Polyergus. Berkeley enumerates sixteen species of the genus Boletus as natives of Great Britain. [Boletus, P. C.]

The genus Hydnium, although named after Seve, the true name of the sevens, is divided into several species. The hymenium is composed of shiny bodies which give to the species of this genus a very formidable appearance. Hence they are called in the country spino-stools, prickle-stools, &c. Several species are esteemed in Great Britain. Some are eatable, but others should be used in their selection. De Candolle says that those which have a dark colour are dangerous.

The genus Fuscina, with one representative in Great Britain, F. hepatica, the pipe-stool. It grows upon the trunks of old oaks and other trees. It is eaten in France. When cut into it is beautifully marked with red and white streaks resembling a fine piece of beef. It is called in France Foie d'Herbe or Foie de Chêne, &c. It has an acid taste, but is rather tough. It has been known sometimes to attain the weight of thirty pounds.

The genera Sistotrema, Trusca, Radulium, and Phlebia are small genera, and not used as food, or in any other way. The species Thelothora 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 Clavarii, which are distinguished by a single or branched vertical receptacle, embrace the following British genera:—Clavaria, Cetraria, Geoglossum, Spathularia, Myxtrula, Typhula, and Pollacillaria. These plants, in their texture and club-shaped forms, resemble the corals, and were actually placed by the older naturalists in the same class. Some of the species of the Clavaria are edible. All the Clavaria are esteemed as food. C. rugosa has an agreeable flavour, and is a favourite of the common people. C. pyxidata are prized on account of their taste. C. cinerea is the species most commonly eaten on the Continent.

The tribe Mitrati have a bulbous, fleshy, margined receptacle. They embrace five British genera:—Morechella, Hetoidea, Vomps, Leotia, and Vibriessa.

The genus Morechella yields the excellent fungus morel. [Morechella, P. C.]

Three species are found in Great Britain. There are also three British species of Helvella as that genus is at present defined. The species of Helvella are edible. H. crispa is considered the best species for eating, but none of these are of great or British, nor poisonous.

The tribe Copulatii, which has a sessile marginated receptacle with a superior hymenium, contains the following British genera:—Peziza, Patellaria, Azcoholia, Burgaria, Dictodium, Tympanum, Conioporus, Stictia, Cryptogenus, Cyphella. Of these Peziza 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 supercilious and club-shaped forms, resembling the corals, and being actually placed by the older naturalists in the same class. Some of the species of the Clavaria are edible. All the Clavaria are esteemed as food. C. rugosa has a agreeable flavour, and is a favourite of the common people. C. pyxidata are prized on account of their taste. C. cinerea is the species most commonly eaten on the Continent.

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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
may be considered as a species of it.

HYPERICUM, a genus of plants belonging to the natural
order Hypericaceae. The calyx is 5-parted, or it has 5
sepal; 5 petals; 3 styles, 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.

H. brachyodes has an erect quadrangular stem, elliptical
ovate obstate leaves with a few pubescent dots, reflexed ovate
lanceolate sepals having pubescent stigmas, obsolete petals
with purple streaks and dots beneath. It is the H. quadrangular
of Fries, and is found in most parts of ditches and rivers.

H. perforatum has an erect 2-edged stem, ovate or ellipti-
cal leaves with numerous pellicid dots, anthers with black
dots, the styles as long as the capsule. It is found in large
clusters, in the plains belonging to the coasts 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. This is one of the plant constituting purple vola-
tile oil, which is aromatic and possibly astrin gent, though as yet it
has been but little used in medicine. Its sensible qualities
have been described as a balsamic, one being expressely
official, entitles 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 of St John's Wort 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 fancifully called the plant Fire Demonus, from a
notion that it was a remedy in maniacal disorders. At one
time the people of Scotland used to carry it about their
persons as a protection against witchcraft and enchantment,
and they fastened green sprigs of it to the top of their
knives, entitling its virtues to a further trial. At this
moment it is little used except in the dress of the lower
classes. Cows and goats will eat the plant, but horses and
sheep refuse it. It is the Hypericum of Dioscorides (iii. 162).
It is also used in the dress of the lower classes.

H. laurinum has a smooth herbageous stem, rather dis-
tant obstate leaves, full of pellicid 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
B. Paul and Minas Geraes, where a decoction of the leaves
is used as a remedy against the bites of serpents.

H. crispinum has a round branched stem, sessile lanceolate
leaves, small and oblong. The leaves have a base full of dark
brown oblong and rounded sepals. It is native in the regions of the Mediterranea,
and is the Hypericum of Hippocrates (Morb. Mul. i. 610); also of
Dioscorides (iii. 161), and the Hypericum quad ad chamapi-
num of Theophrastus (iii. 168). It is used in commerce as a
harmful weed.

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

H. perfoliatum, the JVperoumof Dioscorides (iii. 163).
It has a 2-edged stem; oval, clasping, dotted leaves; fringed
along the margins, large pointed sepals and petals, and sessile flowers.
It is a native of Italy.

H. Corsi has a shrubby erect round stem, linear leaves
in whorls with acute margins, and a bluish linear calyx. It
is the species of Dioscorides (iv. 174), and the Coris 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. Origineum is distinguished by its ascending down-
stem, oval blunt and subcordate leaves full of pellicid 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 comp-
any with H. perforatum. It is probably the "Hypericum
officinale" of Dioscorides (iv. 6), and undoubtedly the Ageratum of Pliny
(xxvi. 4).

H. Olympicum has elliptical lanceolate leaves full of
pellicid dots; a round stem, and whitering corolla and stamens.
It is a native of Mount Olympus and of China. Fries thinks
it probable that this is the "Hypericum officinale" of Dioscorides (iv. 6).

H. crassocephalum is found in mountainous parts of
Greece, on the Rupheian mountains, and is remarkable for
its large sized white flowers. The hardy herbaceous kinds will thrive in any
common garden soil, and are easily propagated by dividing the roots or by seeds.
Those set by the greenhouse of frames will thrive best in a mixture of loam, and
beauty and strike root readily in sand under a box. -J. flavissimus.
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ICE-HOUSE, a building constructed for the purpose of preserving ice through the summer, by excluding, as perfectly as possible, all access of heat, and with it the moisture 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 confection, but also as affording the most effectual means of cooling 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 (sec. 736-738) 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 frequent in those of 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 indispensable appendage.

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 as to moisture, which is even more injurious than heat, may drain off freely. For this purpose the ground should be raised into the form of a flattened cone, upon which should be laid a stratum of straws. Straw is laid upon the straws to the thickness of four 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 hatch. 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 Cobbett, 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 recommend an eastern or south-eastern, 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 started in a large pit, with hollow or double walls, floor, roof, and doors, and furnished with a compact 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 mound, with a surface of about five feet square, and a few feet in depth. It is the opinion of Mr. David Gordon, for constructing an ice-house of the simplest form, principally of timber. In this plan the enclosure is made considerably larger than the ice-house, which consists of a framework of strong timbers, roughly boarded outside, and lined with straw set on end and confined by battens nailed to the timbers. The conical roof is thatched with straw or heath, and the space between the outer boarding and the surface of the enclosure is filled with heath, brushwood, or fir-trees, and neatly thatched or turfed over.

In some situations simple excavations in calcareous soils, with a long circuitous passage by way of approach, are used instead of more regular ice-houses.

In filling an ice-house, the ice should be broken with mallets to a coarse powder, which, according to Loudon, should be composed of particles not larger than those of sand or salt, and well mixed with straw and nicely rolled into the ice-well; its upper surface being kept of a concave shape, and a little water being occasionally added to fill up all interstices, and to facilitate the congelation of the whole into a solid mass. A better method, according to the same authority, is to sprinkle the ice with water saturated with salt, by dissolving it at the rate of a pound of salt to a gallon of water. This salt and water may be applied by a common watering-pot upon the surface of the ice at intervals of two feet from bottom to top of the mass, an extra quantity being poured on when the filling is completed. By this means the ice becomes so firmly compacted as to need the force of a pickaxe to break it up, in the heat of summer.

From the Gardeners' Magazine,' it will be found to keep three times as long as by the common method in the house, and it will also keep three times as long when exposed to the air, from salt water, and consequently salted, having a large capacity for heat than fresh water or fresh ice. Snow is occasionally preserved in a similar manner to ice, being packed into the ice-well and covered over, it being considered that the ice and snow for refrigerating liquids, in ancient as well as modern times, are given in a long paper in the third volume of Beckmann's 'History of Inventions.' (English for that or the other. A reference is made to antiquated authors who allude to the preservation of snow in pits or trenches; and it is stated that a
similar method is pursued in Portugal, where, when the snow has been collected in a deep gulf, some grass or green sod, covered with dung from the sheep-pens, is thrown over it; and under this covering the snow is so well preserved that it may be taken up and transported to a considerable distance throughout the summer.

In connection with the subject of this article, London de-

scribes a watch-case he intended to serve some of the pur-

poses of an ice-house, in which the evaporation of water, constantly trickling down the outside of a close conical cham-

ber elevated above the ground, is employed as a means of refi-

ting; and also, he says, in his 'First Additional Supplement,' an ice-box which might almost be termed a portable ice-house. It consists of an inner and outer box, six inches apart, the interval between which is 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 air-tight by means of project- ing 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. Simi-

lar to this contrivance is, the American ice-safely lately intro-

duced into this country.

ICE-PLANT. [Membranacea, P. C.]

ICHNEUMON, a genus of insects belonging to the order Hymenoptera, and the family Psychidae, in the arrangement of Latreille. The genus, as defined by Linnaeus, included such pugnacious hymenoptera as are furnished with veined wings (the anterior pair present in their place, and a closed or cut-off membrane); the ovaries of the females being furnished in a great degree with articulations, and an ovipositor of various length and complicated structure. The Linnean genus now constitutes a group in- cluding a great many well marked genera and an immense assemblage of species. All these are remarkable for the habits of their larvae, which are parasitic in the bodies of other insects. These bodies the perfect ichneumon perforate by means of their long and sharp anterior ends, 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 (Viteura 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 principally em- ployed in keeping within their proper limits the immense host of lepidopterous larvae, destroying, however, many insects of other orders. Euxomis is the only ichneumon of the Ichneum-

onideae that scarcely any concealment, except perhaps the

waters, can secure their prey from them; and neither bulk, con- formity, nor mimicry can serve to terrify them from effecting their purpose. They attack the rathera small species of insects; they discover the retreat of the little bee, that for safety hides into timber, and, though its enemy ichneumon cannot enter its cell, by means of the long ovipositor itDisable the adjacent link.
Normal group. Acetabrobranchi. Fish breathing with gills, not by lungs. 4. Lophoniscus. Bony fishes breathing by the gills, but having a form. Mr. Macleay 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, Osutopothyrid, a term by which he proposes to designate the osseous fishes having pectoral gills. The following table of his subdivisions of this important order will convey to the naturalist a clear idea of his system.


Tr. 4. Proteronecta. Vertical fins, when existing, inserted under the pectorals, and directly suspended to the bones of the shoulder.

Tr. 5. Alabonecta. Vertical fins, inserted behind the pectorals, and not attached to the bones of the shoulders.

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 Nilson and Eckerman, the fishes of Denmark are in progress of illustration by Henrik Kroyer. Those of Belgium have been carefully examined by M. de Selys Longchamps. In that naturalist's Faune Belge fifty-three freshwater fishes are enumerated, of the forty-three, forty-two being fresh-water fishes of central Europe. They are distributed in the great lakes of the Scheldt as far as Antwerp. The fresh-water fishes of central Europe are the engaging 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 Caspia-Caucasia, published in 1846. Those inhabiting the rivers of Syria have been enumerated by Heckel (1843) from the collections of Kotsch. Fifty-seven species inhabit the rivers Orontes and Euphrates, of which no fewer than forty-five are Cyprinidae. Indian ichthyology has received valuable contributions from McClelland, whose papers have been chiefly published in the Calcutta Journal. In Sweden's 'Fauna Japonica' (1854) 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 1845, in the form of a report on the Ichthyology of China, by Dr. Richardson. From his researches it would appear that the fishes of that region are not only very numerous in regard to species, but also very valuable on account of their economic and medicinal properties. The above 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 in the lowest degree of latitude, the Nicobar group in 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, while including the South Seas, presents a remarkable uniformity in 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 accurately described, 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 Dieffenbach'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 Dr. Peters of Sicily in the southern parts of Africa, at present in progress, promise to make us well acquainted with the ichthyology of that interesting region. With those of the northern part of Western Africa we have had ample information in the valuable memoirs of Lowe on the fishes of Madeira (Zoological Transactions and Proceedings).

The labours of Jentyns on the fishes collected during Captain Fitzroy's voyages have contributed materially to our knowledge of the ichthyology of the coasts of the South American peninsula, 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 been much noticed in detail with the fishes of the United States. They amount, so far as known, to 440 species, distributed through 166 genera and 39 families. In the State of New York there are 126 Acantopothyrid, 35 Malacopterygii, 18 Plectognath, 3 species of sturgeon, and 27 cartilaginous fishes. It is to be regretted that the researches of Dr. Parnell 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 greatest distinctions appear to be made between the fresh and salt waters, whilst the latter, on the contrary, are distinguished by many forms of fishes not found in the sea, and especially near the coast. As far as the distribution of fishes is concerned, the coast of the United States is 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 specific assemblages of fresh-water fish, and in like manner a very narrow strip of land may divide two very distinct marine faunas. The distribution of species 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, assisting often unintentionally in the conveyance of ova from one country to another. Distant regions, presenting similar conditions, such as the Arctic and Antarctic seas, are inhabited by species recognized as identical, or nearly so. It is probable also that the fishes inhabiting the greatest depths of the tropical seas remain relatively immovable, 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 fish will help to illustrate the problem.

The lowest and most anomalous of all the species of fishes, the Brochichotomus, 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 forms connecting the Lancetfish with other genera. The Myxine, or gluttonous hag, almost equally strange 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 Rpistreptoma. The Lampreys inhabit the fresh waters of Europe and North America, but the species in each are quite distinct. Lepadodi, the connecting link between fishes and reptiles, so dubious in organization that its position is still disputed, is an inhabitant of the west of Africa, and a genus characterized (1846) by Dr. Peters on the eastern coast of the same continent.

The rays and sharks are universally distributed, but many of the genera and species are very local and apparently regular in their distribution. It is a fact of vast importance that the southern hemisphere can boast of the greater number, though fortunately the most formidable of the species are exotic. The largest species, as the great Sphéthas marinus, the basking shark, are harmless, and have their favourite habitations in the temperate zone. Size among fishes does not appear to have any relation to latitude. Chimaera is northern and southern, extending from the frigid zone. The Scyliorhiza are for the most part southern and tropical, especially the curious forms of Cestracion and Austracion. Monacanthus inhabits the American and Chinese seas; Triodon, the Indian ocean; Tetrosdon, Diodon, and Bulistes have wider ranges. The typical genus of pipe-fishes, Synemys, is cosmopolitan, and has a very wide geographical distribution. Six species are found in the British sea, two on the coast of the United States, and Mr. Jenyns has described new forms from Valparaiso, Tahiti, and Patagonia. Hippocampus is of the temperate zones of both hemispheres, and in the tropical seas is replaced by Solenostomus and Pogonias. The sturgeons inhabit the Western Hemisphere, the Black sea, and the Mediterranean. Three species are Northern European.

Of the cels, Anguilla, Conger, and Murana are typical and cosmopolitan. Gymnarchus is Egyptian, Gymnotus (the electric eel) is American, both inhabiting the fresh waters of both hemispheres. The common flat fishes are very generally distributed; the largest species is inhabiting of northern seas. The Mediterranean boasts of many species of Pleuronectes. Species of sole are found in both northern and southern hemispheres. The Gadidae are inhabitants of northern and temperate seas, and certain species, as the Tusk, do not range farther southwards than Norway and Scotland. Lepisosteus, one of the few remaining genera of Sauroid fishes, which appear to have played a most important part in the waters of ancient geological epochs, is confined to the rivers of America, and some allied forms to northern Africa. The herring tribe, Clupeidae, has a wide distribution of the typical forms in the southern as well as in the northern hemisphere. The species however are locally distributed; thus the true herring is unknown in the Mediterranean, where its place is taken by the horse mackerel and herring. The American coast herring is very distinct from those of the north. Even within very limited areas, as in that of the British seas, the species have peculiarities of distribution, as we see in the prevalence of the herrings of the northern coast and the southern coast. The horse mackerel is restricted to the south coast of the Irish sea, while it is replaced by the Pilchard on the south-west coast of England and south of Ireland: the white-sait is also a remarkable instance of local distribution. Mormyra, Esox, and Lepisosteus are American, the first in North African; the flying fishes are oceanic and Mediterranean, and the pike proper are inhabitants of the temperate zones. The restricted genus Esox is confined to fresh water.

The important family of Salmonidae has its most valuable members in northern regions, some with a wide range, the same species of trout occurring in Lapland and in Switzerland. In North America, forming the general aspect very similar, depending on characters of form and colour, &c. It is probable also that the fishes inhabiting the greatest depths of the tropical seas remain relatively immovable, and that those of the latter in like manner approach Arctic forms.

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 offset finds its way to Europe. Pimelodus and Cichlithys are American genera of this family; the electrical Malapterurus, North African; Loricari, South American. Equally interesting and well marked in distribution is the fresh-water family Cyprinidae. The true carps are characteristic of the old world; Catostomus and Analalapi of the new.

The common food-fishes of the northern seas, Myxine, Lophius, and Harengus, are chiefly represented in Africa and South America. A single Lophius is a native of Europe, but the species show a distribution like that of Lepisosteus as inhabitants of the United States, and Richardson has described some Australian species. The Goby tribe prevails in Europe and Asia. 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 Gurnards are mostly of northern seas. Some species of the Goby tribe inhabit fresh water, as the genus Thymichoides, which is found in marshes in India. Coniprurus lives in Lake Baikal, and one or two species of Gobius proper live in rivers.

The Mugilidae 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. Alburnus is also a cosmopolitan genus.

The Gadidae and Pharyngidae 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 Antarctic seas. Many species of species of Pomacentridae inhabit the southern seas, and the allied typical genera of the tribe are essentially cosmopolitan. The Cestridae are essentially aquatic.

The family of Sparidae gives the most prominent feature to the ichthyology of the Mediterranean and seas of Southern Europe. Porgius has a wide range, but chiefly through warm regions. The Sciaenidae, very numerous in species, are mostly eel-like. The important family of Trigidae, of which Gurnard is the type, has a very extensive distribution. The true gurnards are mostly European; Scorpina ranges from Europe to Australia. Platypogon is peculiarly Indian. Scolopsis is a genus of the old world, with one or two exceptions.

The Percidae, chief of the Acanthopterygidae, is partly composed of marine and partly of fresh-water genera. The genus Percus is characteristic of the northern temperate zone. Most of the species of Gobio, and Serranidae are cosmopolitan. Mullus and Paralichites are European genera. Holocentris, Myripristis, Priocharax, and Dulus are represented in both hemispheres. Ambassius is an Indian fresh-water genus. The typical forms of Pinguipes, Fistularia, and Pogonias are American. Beryx, Trachichthys, Helotes, Potamia, and Chiroptera are Australian.
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 Dolgelly, 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 saw a similar effect near Genoa, from 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 clayey soils, and that they have been observed in the vicinity of shrubs and bushes. (Stöhr Merkur, 1763) mentions that he saw at Zellerfeld a meteor which at first approached him and afterwards receded from him to a distance of 300 paces; he adds that it then disappeared, and at the end of half an hour it again became visible.

Ocasionally such meteors have been observed to follow or advance towards a spectator; but in general they appear to recede on being approached, 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 them, as few persons have been fortunate enough 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 phosphoretted or a carburetted hydrogen gas, produced by the decomposition of animal or vegetable substances, rises from the ground or from stagnant water, either small in that part of the atmosphere that is nearest to the earth, 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 spontaneously, at a spot where the atmosphere is hot, or where the ground is suddenly heated by a flame communicating itself successively to other parts of a line or column, the latter being in a state of inflation from the agitation of the atmosphere, will give rise to the appearance...
at a motion from place to place. The brightness of the matter 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 ignition is well known to take place occasionally in a mass of vegetable and animal substances while undergoing decomposition, in consequence of the inflammable matter coming in contact with common air or with oxidising agents.

ILFORD. There are two places of this name in Essex, both in the hundred of Bexneet. Great Ilford is a village included for civil purposes in the ward and former chapel of Ilford in the parish of Barking; it forms a respectable settlement on the road from London to Chingford and Colchester, about 85 miles from the General Post Office. It is on the left or east bank of the river Roding, which is here crossed by a bridge. The river is navigable for small craft up to the bridge, under the name of Barking creek. The name Ilford is derived from Morant from the ill ford that must have been here before the causeway and bridge were erected; and by Mrs. Osborne from a ford at the hill, written Hyleford.' Great Ilford has a new church, erected in 1831 by the aid of a grant from the commissioners for building new churches. The chapel was then constituted a distinct parish. The church is in the 'gothic style, with tower and spire,' and is capable of accommodating about 850 persons. Mr. Wright describes it as a handsome building. There is also a small chapel (St. Mary's) a half-mile distant from the church (Trinity Chapel) has been erected at Barking-side in the parish of Ilford, capable of accommodating 465 persons, to which a chapel was added by the generosity of the Rev. Thomas Norton, vicar of the church. Also the same parish. The church is in the Anglo-Norman style, with a small belfry. There are also in the village two dissenting chapels. Ilford ward contained in 1831, 725 houses, namely, 658 inhabited by 701 families, 4 houses building, 1 and 21 uninhabited; with a population of 3512: in 1841 it contained 771 houses, namely, 721 inhabited, 32 uninhabited, and 18 building; with a population of 3742, showing an increase in ten years of 231. The whole of the great Ilford is best known by the clear yearly value of 400l., in the rural deanery of Barking, the archdeaconry of Essex, and the diocese of London. The educational returns for 1833 do not distinguish the yard of Great Ilford from the other divisions of Barking parish.

Little Ilford is a parish separated from that of Barking by the river Roding. The parish has an area of 750 acres, and contained in 1831, 22 houses inhabited by 23 families, and 1 house building; the population was 115: in 1841 it contained 23 inhabited houses, with a population of 189; of whom 30 were prisoners or officers in Ilford goal, which is a house of correction for the county, erected in 1831. The church is dedicated to St. Peter, Linwall, and is surrounded by a green belt of trees, and is approached by a lane surrounded by the old town of Ilford, and by a new one leading to the church. The living is a rectory of the clear yearly value of 400l., with a glebe house in the same ecclesiastical divisions as Great Ilford. There was a school for boys and girls opened in 1833, but children were taught to read every Sunday morning and afternoon in the church. (Morton, History of Essex; Mrs. Osbourne, History of Essex; Wright, History of Essex; Reports of Commissioners for Building New Churches; Population Returns, and other Parliamentary Papers.)

ILICINE. [Acroclinia, P. C. S. J.] ILICICLE. [Frangula, P. C. S. J.] ILICICLE BRUM. a genus of plants of the natural order Illiciaceae. It has five scales slightly coherent at the base, which disintegrate at the back. Petals absent or five subulate inserted with the five stamens on a perigynous ring; a one-celled one-seeded furrowed capsule bursting along the sutures. The only species is a small trailing shrub with opposite, oval, sharp-pointed leaves at the base.

t. verticillatum. Whorled Rbush-grass. It has a trailing glabrous stem, roundish leaves, verticillate whorled white minute flowers. It is found in bogs and marshy places, chiefly in the county of Devonshire. The seeds of this shrub should be planted in a moist situation, if allowed to grow themselves, will spring up regularly every season. It is worth cultivation on account of the delicacy and beauty of its blossoms.

ILMEN, LAKE. [Russia, P. C. J.] IMOLA, INNOCENZIO DA, a pupil of Francis, and a distinguished painter, of the early half of the sixteenth century. His family name was Francucci; he was born in the later part of the fifteenth century, at Imola, whence his surname, but he lived and worked in Florence. 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 only thirteen years of age. However, about 1506 he was placed with Francis, and, according to Manucci, also with Albertinelli at Florence. In 1517 he produced what is now considered his masterpiece. It is a large picture, now in the palazzo Cusani at Bologna, but formerly over the great altar of San Michele in Bosco, Bologna. He painted the left part, the Archangel Michael vanquishing Satan, Saints Peter and Benedict at the sides, and above in the clouds the Madonna and Child surrounded by angels; the whole is treated much in the second manner of Raphael. It 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 Imola's style is termed by Lanzi Raffaellismo, 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.

(Vasari, Le Vite, iii. 188, et seq.; Lanzi, Storia Pittorica, &c.; Giordani, Pinacoteca di Bologna.)

IMPEACHMENT. [Parliament, P. C. J., 279.] IMPEFATORVIA (so named from its supposed imperial virtues) is a genus of plants belonging to the natural order Umbellifereae. It has no caules; obovate petals contracted into an infixed segment. The fruit flattened at the back with a dilated flat border. The species are glabrous, with a few spreading hairs. It is assigned to the subfamily. The umbilics are large and compound, and the flowers white.

1. Ostruthium has a tuberos firm and somewhat creeping root of an aromatic and scented nature. The lower leaves bitter-tasting, the upper smell of the herb; and, of a white or pale flesh-coloured hue. It is a native of Europe and Newfoundland in damp meadows and woods. This species is the Masterwort of old English herbalists, and is a species of poisoning and an antidoate against poisons, a diuretic, and sudorific; and Lervengo affirms that an infusion of it in wine has curedaguehas which have resisted quinine. When chewed, it excites 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.

2. angustifolia, the Narrow-leaved Masterwort, has alternate leaves, oblong lobate attenuated at the base and deeply serrated. It is a native of the Alps and Piedmont. The blossoms appear in June and July, and are of a white colour. This species of the genus is so easily cultivated, and may be propagated very easily, and remains a nomenclature of Botany.)

IMPRESSMENT. [Seamen, P. C. S.] IMPRESSION, FALSE. [FALSE IMPRESSION, P. C. S.]

INCENDIARY. [Arson, P. C. S.; Law, Criminal, P. C. S.] INCENT. 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 either by married persons or persons unmarried. 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 Innocentum, which is the same as Non Castro legem. This law also determines what kind of sexual connection is incest. Incest may be committed either by married persons or persons unmarried. 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.

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The Roman notion of Incestum was not confined to the case of blood relationship. Persons who stood in the relation of parents by adoption 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 Imperial period, and the rules of law that were afterwards adopted probably date from the same time. 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, vii. c. 22; Tacitus, Annal., vi. 19.)

The subject of the Roman Incestum is treated copiously by Reti, Criminales rerum, and with a reference to the numerous authorities.

INCH OF CANDLE. [Auct. P. C.]

INCHBald, Mrs. Elizabeth, whose maiden 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, with whom she found much 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 Le Havre, leaving her a widow and his plays, which had been published, come upon her. She went to Russia, and afterwards to Batavia, where she lives on the income which she had received from her plays, which, in the beginning of the 19th century, were copiously and extensively produced. She is considered as one of the greatest actresses of her time, and is the great dramatic genius not of a very high class; but several of her comedies had much success, and one or two of them still keep their place on the stage. They gained her for the means not only of supporting herself with honourable dignity, but of making a handsome allowance to an invalid sister, and of saving a considerable sum. Her melodramatic comedy of 'Such Things Are' gained her more than four hundred pounds; as much was produced by 'Wives as Were and Maidens as They Are,' and for 'Every One has His Fault,' the money produced by her plays, she received seven hundred pounds. She edited, with biographical and critical remarks, 'The British Theatre,' a collection of acting plays, 26 vols., 1806-1810; 'The Modern Theatre,' 6 vols., 1809-1810; 'A collection of Farces,' 7 vols. Mr. Inchbald was a great genious, and his literary talents are best exhibited by her two novels, 'A Simple Story,' first published in 1791, and 'Nature and Art.' In the latter she 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 relations and friends, to the Roman Catholic poor, to the Covent-Garden Thespalic Fund, and small sums to her laundress and hairdresser, 'provided they should inquire of her executors concerning her decease.' She had written an account of ancient usages in the two last vols. of her 'Modern Theatre' which were worth four hundred pounds for it; and, in obedience to her will, it was destroyed after her death. But her journal, kept regularly for many years, was preserved; and it from her letters were written Mr. Johnson's Miscellany. She was a great lover of the theatre, and when she went abroad on the first visit to Russia, she always took her theatrical packets with her.
In gives and would be 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 own sheep and the cattle of others upon 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 crop. In those parishes where 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 commonable, 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 the right of the so-called common arable, which is a very great inconvenience in various parts of the country, where parties have the right of cutting house-bote, and plough-bote, and fire-bote, and so on in woods belonging, quivi wood, to another party. There is a great deal of land such as that which is occupied exclusively by the commonable, these commonable lands, but these are the most prominent and remarkable of them.

Under such a system as this, it is obvious that those common fields must be re-introduced. The intermixed lands cannot be treated according to the improved rules of good husbandry. It is stated that the simple re-distribution of intermixed lands, now held in parcels so inconvenient in form and size as to be impossible to drain them, would in a very few years clear up the entire waste of the lands from 15s. or 17s. an acre to 30s.

It is the opinion of witnesses examined before the parliamentary committee 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 beneficial drainage is nearly impossible. One witness says: 'I have had occasion to go over two small properties, about 150 acres each; one I found in 301 different pieces, and the other in a little more than a hundred. I mention this to show how the lands are frequently intermixed; the water is often detained at much 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 water should pass off.' In the Midlands counties, it is stated, the common is divided into two crops and a fallow, and every third year the flocks run over the whole field. The same witness considers that a fourth of all 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 cultivation of common lands now has been, and inclosure is likely to be 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 of time occasioned by 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 term of, for, P. C. Any intermixed parcel of common and waste lands, they also require an improved management. It is stated that commons are generally overstocked, partly in consequence of persons turning out more stock than they have a right to do, and partly by persons putting their stock on the common who have no right. In consequence of commons being overstocked, they are profitable to nobody; and a rule for regulating the quantity of stock would therefore be beneficial to persons who are entitled to this right of commons.

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 result from stining those parts of commons that are not worth inclosure, and that it would be highly desirable to inclose portions of a common for the purpose of cultivation, and to allot such portions of it, whilst it would be impossible to do more than to limit other portions of it. A state of inclosure is the right of the wild animal, or for a certain number of animals, according to age, size, and capability of eating. 'The commons in fact are not now subject to the laws of the lands or parishes, they 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 stated that since 1800 about 2000 inclosures acts have passed; and prior to that time about 1600 or 1700. It seems doubtful from the evidence whether the 1600 or 1700 comprehend all inclosure acts passed before 1800. These 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 (6 & 7 Wm. IV. e. 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, many of the common lands and fields, the lands and the lands of the several proprietors of the same are frequently very much intermixed and dispersed, and it would tend to the improved cultivation and increase of the produce of the common lands and lands occupied by the proprietors of the same, and to make a large number of lands advantageous to the proprietors thereof, and persons interested therein, if they were enabled by a general law to divide and inclose the same,' &c. Inclosures have been made under the provisions of this act, in which the powers which it gives are limited, for the 'act applies solely to lands held in severity during some proportion of the year, with this exception, that slips and balks intervening between the cultivated lands may be inclosed,' and can only obtain one by lapsed of time. The chief motive to this dealing with commons appears to have been, that they thus got the inclosure done cheaper than by applying to parliament for a private act.

In 1844 an act of Commons was appointed to inquire into the expediency of facilitating the inclosure and improvement of commons and lands held in common, the exchange of lands, and the division of intermixed lands. Under this act, the committee were to inquire, in the first instance, into the state of many commons, 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 extract 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. 115), the object of which is thus stated in the preamble:—'Whereas it is expedient to facilitate the inclosure and improvement of common lands and lands held in inclosure or divided into parcels, and the partial or entire exchange of such lands, commonly called arable commons, or new fields, and to obviate the detrimental effects of such improvements, and to encourage and facilitate such exchanges and divisions of lands, between the proprietors of 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.

It 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, and may be of interest to some. 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 within forests...
miles of the city of London, or within certain distances of other towns, which distances vary according to the population, shall be subject to be inclosed under the provisions of this act without the previous authority of parliament in each particular case, excepting those parts of India which are town-greens or village-greens, and contains other regulations as to them. The 30th section provides that an allotment for the purposes of exercise and recreation for the inhabitants of a neighbour-
hood may be required by the common-pers under the act, as one of the terms and conditions of an inclosure of such lands as are mentioned in section 30.

The 108th section makes regulations as to the allotment which, upon the application of the labouring poor, and section 109 the allotment wardens (appointed by section 108) shall from time to time let the allotments under their management in gardens not exceeding a quarter of an acre each, to such poor inhabitants of the parish for one year, or from year to year, at such rents, payable at such times and on such terms and conditions not consistent with the provisions of this act, as they shall think fit.

Section 112 provides for the application of the rents of allotments; the residue of which, if any, after the payments mentioned in this section have been defrayed, is to be paid to the overseers of the poor in aid of the poor rates of the parish.

Sections (147, 148) provide for the exchanges of lands not subject to be included under this act, or subject to be inclosed, as the case may be; no proceedings for an inclosure shall be pending, and for the division of improved lands under the same circumstances.

Under section 152 the commissioners are empowered to revoke any inclosure or allotment so as to restore a man inhabiting a part of it to the possession thereof, to be in the hands of the select committee; and there can be no doubt that agriculture will be greatly improved, the productiveness of the land increased, and employment given to the poor by this judicious and important act of legislation.

The 'London Gazette' of August 22nd, 1845, notified the appointment by the Secretary of State of two Commissioners of Inclosures.

(Report from the Select Committee on Common Inclosure, together with the Minutes of Evidence and Index. The Report is accompanied with maps which explain various parts of the evidence. A complete digest of these Minutes of Evidence would form a very instructive article on the state of agriculture in England at that period, and especially as regards the work of the Wise men here above mentioned is of necessity very incomplete. The witnesses appear to agree in the main, but there are some differences of opinion, which a reader of the Minutes will not fail to see.)

INCORPORATION, TAXATION, INCUBATION, ARTIFICIAL. [Poultry, P. C., pp. 477, 478.]

INDUCEMENT. [Barnes, P. C.]

INDIA. It was intended to give, under this head, a general view of all the territories of Hindustan, their areas, population, revenue, by whom held, names of the great divisions, and other details political and statistical. It will be convenient, for the sake of bringing down the information to the latest date, to postpone the article by referring it to Taxonomies of India, P. C. S.

INDIAN LAW IN THE MININSON. The act of the 3 & 4 Wm. IV. c. 85, by which the privileges of the East India Company are regulated, provides for the establishment of a Law Commission in India. The 58th section rectifies that it is expedient, subject to such special arrangement as local circumstancies may require, that a general system of judicial establishments and police, to which all persons whatever, as well Europeans as natives, may be subject, should be established in the East Indies, and that such laws as may be applicable in common to all classes of the inhabitants, having a due regard to the rights, feelings, and peculiar usages of the people, should be enacted, and that the laws, and customs having the force of law in the East Indies, should not be altered.

For this purpose the appointment of a commission of five members was authorized, to be called 'The Indian Law Commissioners.' They were to report from time to time, and to suggest such alterations as they should consider could be beneficially made in 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 and Chartered Companies. India is subject to 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 the benefit of the 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 not taken 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-

ISTATE 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 and a collection of decided cases. This report was signed by Messrs. Macaulay, J. Ramsay, M. Macleod, 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, 1836, No. 132.)

INDUCEMENT. [Laxading, P. C.]

INFAMY (from the Roman Infamia) in English law is not easily defined. There are certain offences which are commonly considered such that conviction and judgment for such offences renders a man infamous and incompetent to be a witness. The absurdity of the punishment, or refusal of the judgment, of a man convicted for an act of which he can only be guilty is a very curious part of the system of law. This is the effect of the act, and without the act, a man convicted of a felony shall have undergone the legal punishment for it, he shall be the same as a pardon under the Great Seal; and (§ 4) no misdemeanor, 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, enacts, that no man shall be excluded from giving evidence, though he may have been convicted of a felony, when not a witness against himself.

Certain offences enumerated in the 7 & 8 Geo. IV. c. 29, § 9, are infamous crimes, with reference to the provisions of that act. Though infamy does not disqualify a man from being a witness, it may be urged as an argument against his credibility.

The only satisfactory definition of infamy would be a per-

manent legal incapacity to which a man is subject in conse-
quence of a conviction and judgment for an offence, and which is not removed by suffering the punishment for the offence. By 2 Geo. II. c. 24, § 6, persons who are legally convicted of perjury or subornation of perjury, or of taking and asking any bribe, are incapable of being members of parliament. They are therefore in-

famous: 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 judicium publicum; and in other cases it was a direct consequence of an act, as shown in the following example. F. C. S.

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 furti, and vi honorum raptorum; actio seditiose; actio raptorum; actio tutelae, &c. In all cases a judicial sentence, or something analogous to it, was necessary, before Infamia could attach to a person. Among the cases in which Infamia followed as an immediate consequence of sentence, F. C. S. notorious are 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 gained a living by aiding in prostitu-

tion. 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 (citius), but he had lost his political rights. The infamous man was also under some disabilities as to his so-called private rights. He was limited by the Prout's edict in his capacity to postulate (this is, take the internal measures for founding or defining laws, or advancing public business). In this respect the appointment of a commissioner of five members was authorized, to be called 'The Indian Law Commissioners.' They were to report from time to time, and to suggest such alterations as they should consider could be beneficially made in 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 and Chartered Companies.
INFANT \( \text{HEIR.} \) \( \text{[HEIR, P. C.]} \) INFANT TRUSTEE. \( \text{[TRUSTEE, P. C.]} \)

INFANT, in the law of Scotland, from the same origin as the English term efferent, expresses the ceremony by which a person succeeding to another by descent, settlement, or contract, 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 symboilical modes of characterising events. Suppose a very ordinary case—that a person 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-feud 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 appointee of the tenant in possession. 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 tenant to the other party. The receipt of the symbols then placed a coin of the realm in the hands of another party, who must have had a notary public—this being the form in which a protest is taken in the hands of a notary in Scotland. Two other symbols were written, the procurator, with the authority on which it proceeded, was narrated in a deed called an instrument of sasine, in which the notary publicly attested the transaction. The preservation of this cumbersome ceremony down to so late a period 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 was recorded in the Register of Sasines 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 sasine 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 Viet. c. 55, passed 21st of July, 1846, and called 'An Act to simplify the form and diminish the expense of obtaining sasine in heritable property in Scotland.' It simply provides that 'it shall not be necessary to proceed to the expenses of a title deed when the same is to be given by way of sasine thenceforth; but sasine shall be effectually given therein and sasine obtained, by producing to a notary-public the warrant of sasine and relative writings, as now in use in the laws and usages of Scotland, containing the instrument recording *. * * an instrument of sasine, setting forth that sasine had been given in the said lands, and subscribed by the said notary-public and witnesses.' There has been little opportunity to observe the working of this act, but it is evident 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.

INFORMER. An informer is a man who lays an information or prosecutes any person in the King's courts for some offence against the law or a penal statute. Such a person is generally called a common informer, because he makes a business of laying informations for the purpose of obtaining his share of the penalty. [\text{INFORMATION, P. C.}] Persons are induced to take the trouble of discovering offences, for which a pecuniary penalty is inflicted on the offender, by the promise of the reward; and if the penalty is imposed for the public benefit, we may conclude that the maker does the public a service. But still the business of a common informer is looked on with dislike, and he who follows it is generally despised; and perhaps the character of common informer is one of those that are not dangerous to the public. They stand in a like situation to the common hangman. This dislike of informers, simply as such, is one of the ancient prejudices, who have their benefactor. The real foundation of the dislike however is, that they 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 he wishes to have his information must be founded. It is the same principle which 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. What a penalty is too heavy, or when the law that imposes generally disliked by the people for any reason, good or but the popular dislike finds a definite object in the informer wha causes effect to the common sense of the community. The law is overlooked, because the legislature is a number of persons. The informer is one, and his agency is seen and felt.

In absolute governments there are spies and political informers, 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 to tyrannical govern-
of difference appears in their siliceous 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 Bami, 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 (Callatisnetta and Cattarles), and Africa (Oman), 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 Oman and large tracts in Egypt and Arabia. Portions of this tract have, however, been described by M. Roset 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 Polierschief (polishing slate) of Bilin and Planitz in Bohemia, and of the Habichtswald near Cassel, the Bergmehl of Santa Flora in Tuscany, the white marls in the peat of Franzenbad 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 lavas, in the 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 (Kieselguhr) of Franzenbad 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 Synedra capitis (fig. 9); while that of Bilin is composed chiefly of Gallionella distans (fig. 8) almost exclusively. (Ehrenberg.)

Infusoria are mentioned in the moya (volcanic mud) of Mexico, and in the edible clay of the Amazons River, by Ehrenberg; in the rock salt and the marl which accompany it at Cordoba in Spain, by Marcel de Serres; they are assumed by Ehrenberg to enter largely into the composition of flint, which indeed readily shows Xanthidia and Pyxidincula. The bog-iron ore (Raseneisenstein) common near Berlin is composed chiefly of Gallionella ferruginea. A kind of semipolish lying in nodules in the Polierschief of Bilin is composed of the same siliceous relicia (Gallionelle), as the true polishing slate, but they are cemented together and filled by a calcareous paste. With these Ehrenberg finds spicula of sponges. The precious porphyry opal of Kaschau, and the serpentine opal of Kosanite 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. Bergmehl
2. Kieselguhr
3. Polierschang
4. Sassgheifer
5. Semipolish of Polierschief

The above consist entirely or partly of the shells of Shield-Infusoria.

6. Semipolish of the Dolerite
7. Precious opal of the porphory
8. Flint of the chalk
9. Gilberde (yellow earth)
10. Raseneisenstein
11. 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.

And for comparison the following outlines of mixed marine and fresh-water species common in the Polierschef of Bilin and the Peat and Kieselguhr of Franzenbad, Egra, San Flora, &c.

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

11. Xanthidia renocau.

List of species of infusoria from the Kieselguhr of Franzenbad—Navicula viridis (plentiful), N. gibba, N. fulva, N. librite, Gomphonema paradoxum, Gomphonema olivatum (fresh water species now living near Berlin); N. viridula, N. striata (now living in the sea, the second also lives in the Carlsbad water); Gallionella varia.

Species of infusoria in the peat bog of Franzenbad—Eunotia granulata (plentiful), Navicula viridis (rare), Bacillaria vulgaris, Cocconeis umhultana, Gomphonema paradoxum.
Species which occur in the Kiel Canal of the Isle of France—Basillaria vulgaris? (plentiful), B. major, Navicula fulta? N. gibba, N. bifrons (living near Berlin).

In the Bergemehl of Santa Fiora—
Syndera capitata (plentiful); with this are S. ulna (living both in fresh water and sea); Navicula inequilata, N. capitata, N. viridula, N. gibba (fresh water species); N. viridula (living in Baltic); Eunotia granulata, Navicula foliis (distinct); Cocconeis unisulcata (marine); Gomphomena paradoxica, G. vacutum, G. acuminatum (living near Berlin); Cocconeis cymbiforme (fresh water); Gaillonella italicca; Spicula of spinogon or spongiella.

In the Po1 of the River of Bilo—
Podosphaera navis (plentiful), Galionella distans, Navicula scalarum, Bacillaria vulgaris? (probably all marine). In the Leli Tripoli—
Galionella distans (plentiful), Podosphaera nanata, Basillaria vulgaris? (probably marine).

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

At Gainsborough, Mr. Binney found under peat, abundance of Gaillonella. At Bridlington, we have observed in white and brown marls, Eunotia serra? Bacillaria vulgaris, Navicula inequilata, N. viridula, N. phaeocerata, Cocconeis laneculata, a new and beautiful Campildocius (C. zonale), etc.

The North American localities have yielded to Bailey and Ehrenberg a large catalogue of infusoria. Ehrenberg enumerates:—
Amphipora—one species.
Cocconeis—two species.
Eunotia—seven species.
Fragilaria—three species.
Gomphomena—four species.
Himmites—four species.
Navicula—fourteen species.
Staurastrum—two species.
Tabellaria—three species.

With these three forms of spongod spicula, and two species of Thyphoclum.

Flora are mostly derived from beds lying under peat.—
The Richmond earth (of micocene date) yields—
Cocconeis radiata and other species (fig. 3).
Achnococys supercilious and others (fig. 3).
Navicula, several species.
Gaillonella.
Dietrichia fuscata (fig. 1).

In the chalk marls of Oman, Sicily, Greece, etc. occur many living forms, Actinothamn—ten species.
Amphididium—two species.
Biddulphi—one species.
Cocconeis—one species.
Cocconeis—seven species.
Dietrichia—four species.
Eunotia—two species.
Gaillonella—two species.
Griammatophora—four species.
Halmocoma—one species.
Navicula—six species.
Sirellia—one species.
Syndra—one species.
Tenella catena—one species.
Triceratium—one species.
In the white chalk and flint of Europe, and also living,—
Fragilaria rhodosa—Gravesend.
striata—Gravesend.
Gaillonella aurichales—Riga.
Peridinium pyrophorum—Gravesend.
Xanthidium furcatum—Gravesend.
hirustum—Gravesend.

Dr. Mantell has been unable to discover Fragilidium in the chalk marls of the Elbe, but he has found it in the chalk of Dover. (Ann. Nat. Hist., Aug. 1845.) Gaillonella aurichales has been regarded as an Oncidiaria; and it appears doubtful whether the so-called Xanthidium of the flints and chalk is really the same species that occur in fresh water.

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

Recent Florulitite and other soliments.
Recent deposits of the Lembre period.
Recent Tertiaries.
Eocene Tertiaries.
Chalk deposits.
Oolitic deposits.

The relative abundance of the Infusoria in these several strata, as in the Cretaceous strata, is again observed, as there areTI]e same peculiarities in the Jurassic, and the Cainozoic periods. It is true that Ehrenberg, by assigning to the cretaceous area the calcareous marls of Oran, Sicily, and Greece, gives a picture of the flora of Mesozoic times, and that the upper Cainozoic is a period of infusoria, but the influence of such localities as the Rotaliaceae, Tint allowed, 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 Polythalamiae extend, and taking into consideration the fact that some species which occur in the chalk of Europe are quoted by Ehrenberg from unquestionably micocene strata in America, we shall hesitate to admit that these truly micocene species are at all causal with the white chalk in which comparatively very few remains of the group occur, and these not of the same species as those which abound in the other deposits.

Another point 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 previous discoveries of geology had prepared an easy admission for the opinion that many of the tertiary forms of infusoria were indistinguishable from living races; such is the fact in regard to all the invertebral races; but with very few, and those not always allowed, exceptions, the secondary strata have been found to contain only extinct forms. It is true to say, the minute Polythalamiae and found many of them similar to living types, and confirmed this influence by independent researches among the infusoria. Supposing these opinions of the Latin microscopist to be confirmed by future inquirers, we shall find that they involve no innovation of the relations of zoological forms to geological time, which 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 (spoke exactly), its constituent quantities (such as 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 organizations.

A rule drawn from Fishes cannot be applied to Moluscas, a law based on Crustacea cannot be received for Micronoria, without living examination; and Paleontology 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 characterize 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 species—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 supertertiary deposits. Is it to be explained by supposing those deposits to have been formed while the relative level of land and sea was different from what it is at present, and the sea was not in 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 land, as well as mixed in strata and deposits, along the courses 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 leaves that now occur in the River Hudson that species once imagined to be truly marine live in juxtaposition with the species of fresh waters. There may probably be, in a class of being associated with alluvial waters, a greater independence of habitat, as well as mixed in strata and deposits, which have little need of climate, and which require the extrinsic of lime from a state of solution in the waters which they inhabit. In confirmation of this view, we find the
sponge of the sea matched by the molluscan of fresh water, each extracting alia from the liquid, but the caulliferous plants, which are almost unrepresented in our inland lakes and streams. (Ehrenberg, Die Infusorienschen; Memoirs of the Berlin Academy, and Translations in Taylor's Scientific Memoirs; Read paper before the Royal Society.)

Ingen-Houz, Johan, a distinguished natural philosopher, was born in 1730. He was at an early age permitted to practice 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 received into the Philosophical Society, and soon attracted 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 appears also occasionally to have corresponded with Franklin on the subject of electricity, which was, at that time, rapidly rising in importance.

The reputation of Ingen-houz as a physician must have been much increased by jeannette Maria Theresia, who lost two of her children by the small-pox, having directed her ambassador in London to consult Sir John Fringle respecting the choice of a physician whom she might invite to court for the purpose of inflaming the fire of the imperial family, Sir John, then president of the Royal Society, without hesitation recommended Dr. Ingen-houz: 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-houz or under his immediate inspection. The empress, in testimony of her sense of his merit and attention, gave him the titles of aulic counsellor 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-houz 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 especial 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-houz had an opportunity (at Leghorn) of making some experiments on the torpedo: he found that the animal gave the shocks most frequently when he stood or walked a few inches from it; being contained so strong that he was almost obliged to quit his hold, and he remarks that they resemble the discharge of a number of small Leyden jars through the hands.

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 1777, under the title of 'Experiments upon Vegetables, discovering the power of purifying the Air in the Sunshine and of injuring it in the Shade,' &c. The work was translated into French by the author, and published in Paris in 1780.

In the 'Philosophical Transactions' for 1779, there is an account of an electrical machine which, about that time, Dr. Ingen-houz had constructed; this consisted of several pasteboard disks, about four feet in diameter, which being covered with varnish were fixed upon an 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 disks were revolved in an insulating vessel, gave rise to a spark between the machines sparks above a foot in length. This probably led to the invention of the plate electrical machine, which is generally ascribed to Ingen-houz; it consists of a couple of disks, 12 inches in diameter, placed between two cushions, forms a very elegant and, if made of considerable magnitude, a very powerful apparatus.

Dr. Ingen-houz published in English a work entitled 'New Experiments and Observations concerning various physical Subjects,' translated into French, and published 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 1748.


Inobita, in law of Scotland, is a writ by which a creditor may proceed against those who are to whom he is indebted, either to favoured creditors or to other persons. Nomically 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 privilege or the property on which it is to be founded on some obligatory written document, or established 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 impinge every 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 inquirer a right to draw the price 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 inquirer has a preference over them if the debts have been incurred subsequently to the inhibition, but not otherwise. The missus or inobita occasioned are of very intricate questions.

Injury, Injuries. As these words are vaguely used, it is as well to specify what is understand 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 civil rights belonging to individuals considered as individuals. Public wrongs are 'a breach and violation of public rights and duties,' and 'are distinguished by the harsher appellation of Crimes and Misdemeanours.'

This is a confused statement. The true nature of Injury is however contained by the expression in Blackstone's commentary on what is Injury 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 man cannot recover damages or compensation when there is a damnum absque injuria, 'injuriosity' or 'uninjuriosity' for an 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, without being such acts as are forbidden, and for an act of science can get nothing in return, then, for instance, a man may act 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 at common law or by statute, an unlawful act.

The Roman word Injuria, as already observed, signifies generally anything which is done contrary to law (quod non juris factum est, hoc est contra juris). In its narrow sense, Injuria 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 him. Injuria might be done to a man either in his lifetime or after his death. For 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 Injurious. (Gosia, iii. 230-235.)

The nature of these injuries was to be ascertained. In injury to a man's person, it was to be determined by the court whether it was a legal injury or not. If this appeared, it was to be considered as an injury, whereas a wrong done to a man's property, or to his goods, was a wrong that was not an injury.

Injury, as such, is not a distinct species of civil wrong, but is to be regarded as a species of all wrongs, except Crimes and Misdemeanours. The Roman Injuria belongs both to the head of 'Law Criminal' and 'Law Civilian.' Vol. II.-M.
In some cases damages were got: in others, the offender was punished in his person: in some cases he might be punished by a pecuniary outcry and in his person also.

The common, the non-legal, use of the words injury, damage, &c., is so general as to involve notions of Bigot and Wrong generally. But people have often a clear perception that a damage is done for which no compensation can be got by legal means, though compensation is due according to the general principles on 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 possibility of inscriptions 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 bailments, and is placed by Sir W. Jones, in his Treatise, under the second subdivision, Locatio Operis, of the general head of Location.

The law makes the innkeeper responsible for the safety of the goods of persons coming to his house, in the language of the ancient writ, causid hospitandi; but he may be released from his liability either by inattention on the part of the guest to such reasonable rules as the innkeeper may think proper to lay down for the protection of the property of his guests; by any act of negligence on the part of the guest himself, or by his making use of the house not as it is before said, causid hospitandi. Thus, if an innkeeper requires his guest to put his goods under lock and key, and the guest leaves them in a passage, whereby they are lost; or the goods are put away in a less secure part of the house than the innkeeper himself had promised, he may not recover for the goods.

The subdivision of this general rule requires that the law should be made still more strict against innkeepers, as the good faith and responsibility of the innkeeper form the only security of the traveller. The Roman law on this subject is contained in the Digest iv., tit. 9. (Smith's Leading Cases, Caly's Case; Treatise on the Law of Bailments, by Sir W. Jones.)

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INSANITY. (L. S. C. S.)

INSCRIPTIONS. (Inscriptions) is, records of public or private occurrences, of laws, decrees, and the like, engraved on stone, metal, and other hard substances, exhibited for public inspection. The custom of making inscriptions 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 laws of the other cities or states, as illustrated by the regulations of the cities of Athens, Rome, and other great powers, were 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 the same of his own use. Previous to the invention of the art of printing, inscriptions set up in a public place were the most convenient means of giving publicity to that to which it was necessary or useful for every citizen of the state to know.

Inscriptions therefore are, next to the literature of the ancients, the most important sources from which we derive our knowledge of their public, religious, social, and private life, and their study is indispensable for every one who desires to become intimately acquainted with the history of antiquity.

For the history of the languages they are of paramount importance, since in most cases they show us the different modes of writing in the different periods, and exhibit us to the language and progress of thought; and it is manifest that the ancients 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 these things to the casual notice of the inscriber. After the fall of the Roman empire in the west, inscriptions still continued to be made very frequently; but as the ignorance of the middle ages increased, and as all knowledge became more and more confined to a few, the institution 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 ancients chose such materials as were least subject to destruction, viz. stone or metal. The stone most commonly used was marble cut in slabs, but sometimes inscriptions were engraved on clay; and in a few cases, common metal was brass or bronze, though we have instances also of lead, tin, and gold being used. If we believe the accounts of the ancients, inscriptions were made even in the mythical ages (H. v., 4; ix. 1, 1); but such inscriptions, existing in later times, were probably forged, and we cannot suppose that inscriptions were made until the art of writing was pretty generally known.

Greek Inscriptions.—The earliest Greek inscriptions which we may safely take to be genuine, but all of which have perished, were the lists of the victors in the Olympic games (Paus., iii. 21, i.; v. 4, 6, &c., the recents of the musical contests at Sicyon (Plutarch, De Mus., 3, 8), and the chronicles of the priestesses of Hera (Juno) at Argos. The earliest among the extant inscriptions do not seem to have been made much before the year B.C. 880.

All inscriptions are composed either in prose or verse, but the former compose by far the greater number. The prose of the public documents is usually still, and their style is not unlike that of official documents of our own time. All the inscriptions are written in capital letters, and without any punctuation or separation of the several words, which often renders it difficult to read and understand them properly. The ordinary are of the style. In some of the letters a guest uses his room in the inn as a show-room, in which a number of people are allowed to have access, and not as a lodging-room, the responsibility of the innkeeper.

The general interest seems to require that the law should be made still more strict against innkeepers, as the good faith and responsibility of the innkeeper form the only security of the traveller. The Roman law on this subject is contained in the Digest iv., tit. 9. (Smith's Leading Cases, Caly's Case; Treatise on the Law of Bailments, by Sir W. Jones.)

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building walls for the protection of the city. In the fourth century of our era religious fanaticism caused still greater havoc. Buildings 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 destructive influence of rain and air, it is astonishing to see the number of Greek inscriptions that have been preserved down to our own time.

The first modern writer who conceived the idea of making a collection of ancient inscriptions was Cyprus. On the Ancona, who undertook, in a.d. 1620, a journey to Italy, Greece, and Asia Minor, and brought back a great number of inscriptions, which he collected in 3 vols. MS., which are still extant in the Bargello, but are said by M. Lenormant to have been subsequently lost. After Cyrus, a long time elapsed, during which the attention of the learned was chiefly directed towards Roman inscriptions. Silvio Maffei, and after him J. Casorelli and T. M. Rapino, 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 Arcauliana (also called "Oxoniensia," containing twenty-six Greek inscriptions in 1628, fol., by Peires, London, 1628, 4to., by Frideaux, Oxford, 1676, by Maittaire, London, 1732, and by Chandler, Oxford, 1765; Oct. Faberius, 'Inscriptions Athéniens Graeca et Latinae,' Rome, 1629, 8vo. vol. with a supplement, London, 1520, 4to.; J. Spon, 'Itinerarium in Italiam, Ilyricum, Graeciam, et Orientem,' Lugdun., 1753, 8 vols. Svo.; Thom. Reinæus, 'Synagoga Inscriptionum Antiquarum,' Lipsiae, 1629, fol.; W. Curtius, 'Inscriptiones Latinae Summorum,' London, 1651, Svo.; R. Fabreti, 'Inscriptiones Anticae,' Rome, 1699; A. van Dale, 'Dissertatio Antiquarum et Graecorum cum Romanorum Apulorum inscribenda,' Amsterdam, 1680, 4to.; F. Goeri, 'Inscriptiones Anticae Graecae et Romanae quæ extant in Extribus Urbibus,' Florence, 1737, 3 vols. fol.; J. A. Marturi, 'Novus Thesaurus Vetustatis Veterum,' Venice, 1739, fol. by S. Donati, Locca, 1765, &c., 2 vols. fol.; E. Curtini, 'Inscriptiones Atticae nune primum e Mafell Schedia edita,' Florence, 1752, 4to. The material collected in these works was greatly enlarged by the collections of inscriptions made by travellers, as Pococke, P. M. Paulaudi, Torremuzza, Passowei, Wallpole, C. Vidaus, and others. With the assistance of these further accessions, F. Osani began, in 1829, his 'Syllogorum Inscriptionum Antiquarum Graecarum et Latinae,' of which eight fasciculi in fol. appeared; and P. G. Weiheker published a smaller collection of metric inscriptions, 'Syllogium Epigraphum Graecorum ex Marmore recueilli,' Rome, 1828, 4to.

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. Boeckh undertook the editorship. The first volume of this 'Inscriptiones Graecae et Latinae,' vol. i. appeared in 1828, and besides the most ancient inscriptions, it contains those of Attica, Megaris, Peloponnesus, Boeotia, Locri, Phocias, and Thessaly; the second volume, which appeared in 1848, contains the inscriptions of Aescharnania, Epurus, Illyricum, the islands of the Ionian Sea, of Macedonia, Thrace, Samothrace, the islands of the Aegean, Rhodes, Crete, Cyprus, Caria, Lyais, Mycia, and Bithynia. This great work, in two hundred and twenty volumes, is now the most complete collection of Greek inscriptions. They are arranged, as appears from the above enumeration, according to the countries and localities in which they are found, and in each volume, the inscriptions of Athens, Boeotia, and Attica, have been judiciously classified into ten sections:—1. Acta senatus et populi, universitatum et collegiorum; 2. Tabulæ Magistratuum; 3. Tituli Honorarii; 4. Donationes Tituli et Operum Publicorum; 5. Orationes Oratorum; 6. Deificationes; 7. Monumenta privata, maxima quereluæ. It is partly owing to the influence which Boeckh's 'Corpus Inscriptionum Graecarum' exercised upon the scholars of our time, and partly to the latter being the first comprehensive 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,' I, 1839, reprinted in 1648, and at Helmstedt, 1860, fol., Martin Sauer's, 'Corpus Inscriptionum Graecarum,' 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 are found, the publication of which is now still in guish between the earlier and later inscriptions, and he has some which are evidently not genuine. After that of Schrader followed that of Thom Reinæus, which was published

in the second volume of the 'Corpus Inscriptionum,' but others were published too late for inclusion, and will be published in a third volume. In the meantime, Boeckh prepared a supplementary volume of those subsequent works are:—Ph. Luchs, 'Inscriptiones Graecae et Latinae recuelliens in Graecia, Paris, 1836, &c.; Jansen, 'Musei Lugubri-Batavi Inscriptiones Graecae et Latinae,' Lugduni Batavorum, 1838, 4to., E. Curtius, 'Anecdota Delphica,' Berlin, 1843, 4to., the same, 'Inscriptiones Atticae nuper repertae duodecim,' Berlin, 1843, Svo., the travel of C. J. Leake, Fellows, and Hamilton; the work of M. Hort contains a large number of inscriptions from Asia Minor; and lastly Latronne, 'Recueil des Inscriptioh Graecae et Latinæ des Egypte,' vol. i., Paris, 1842, 4to., and the Philological Journal of Germany, France, and England.

Latia Inscriptiones.—These are not less numerous than those of Greece, and are found in great numbers at Rome, in Italy, and all the countries which were once 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 there are a vast number of inscriptions to which 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 to that extent as those of Greece, where such inscriptions were enough to form the basis of all our knowledge. Roman writers do not appear to have been so much directed towards this source of information as that of the Greeks, for there is no instance of any collection having ever been made 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 the walls of people's houses, and the arches of the barbarians. But a great number was still preserved in Rome and Italy, which attracted the attention of the learned ever since the eleventh century. 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 is printed in Mabillon ('Vetustas Annuil., p. 358, &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 Cyricus of Ancona, who undertook his travels at the request and the expense of Pope Nicholas I. The first printed collection of Latin inscriptions which is now extant is that of Deferens Papias, printed at Augsburg in 1651, and in its number, on seven folio leaves, under the title of "Romanas Vetustas Fragmata in Augusta Vindelicorum et eius Dioeœsit," in Augsburg, 1651. Another work, which is now extremely rare, was published by Laurentius Asterius, at Feni, of which a second edition by F. Polycandus appeared in the same year. The collection published by the bookseller Mancocci, at Rome, in 1526, in folio, under the title 'Epigraphi Antiqui Urbis Romae,' contains scarcely any other than sepulchral inscriptions.

After these collections of local inscriptions, B. Amantius and P. Apianus, supported by the liberal merchant Rallvand von Fugger, published a general collection under the title of 'Inscriptiones Sacrarumvetastris,' Ingolstadt, 1834, &c. Soon after, the learned George Fabricius published a considerable part of this 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, 1560, reprinted in 1648, and at Helmstedt, 1860, fol. Martin Sauer's, 'Corpus Inscriptionum Graecarum,' 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 are found, the publication of which is now still in guish between the earlier and later inscriptions, and he has some which are evidently not genuine. After that of Schrader followed that of Thom Reinæus, which was published...
A somewhat more complete and accurate collection of 4688 inscriptions was published by Fabrethi under the title 'Inscriptionum Antiquarum, quae in Aedibus Patrum asservantur Explicatio et Additamentum,' Rome, 1799, fol. (some copies date of 1702, but this is only a bookseller's impression).

But all the works here mentioned are eclipsed by the undertaking of James Gruterus, which was to contain all the inscriptions that had been made known. He took the work of Smeudis as his foundation, and was actively assisted by Joseph Scaliger. The collection appeared under the title 'Inscriptio Antiquae totius Orbis Romani,' Heldberg, 1631, fol. J. G. Grotefend afterward 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 F. Burmann, who, assisted by many other scholars, published the new edition of Gruterus, under the title 'Inscriptiones Antiquae totius Orbis Romani, in absolutissimam Corpus redactae, olim auspiciis J. Scaligeri et M. Velsleri, industriis autem Jani Gruteri, nunc notis Maruardii Gredi omnem. cura G. Gracoli,' Amsterdam, 1707, fol. Maruardi Gude, who had travelled in Italy, likewise prepared a collection of inscriptions for publication, which however was edited after his death by F. Hoesch, Leonardus, 1731, fol. This collection however contains many forgeries made by the notorious Ligorius. A collection of 2000 inscriptions which had been gathered by Doni, was published by Gori, 'T. B. Doni Inscriptiones Antiquae,' Florence, 1641. In 1739, he published 'Novarum inscrptionum Veterum Inscriptionum,' Milan, 1739, 4 vols. 4to., with a supplement by S. Donatus in 2 vols., Lucus, 1765, 8vo. Among the collections of inscriptions published at a later time, there are of great importance, with the exception of the selection from all the known inscriptions which was published by J. C. Orelli, under the title 'Inscriptio Latinarum selectarum amplissima Collectio ad illustrandam Romanae Antiquitatis Disciplinam accommodata, &c. cum ineditis Hagenbuchis suis Annotationibus,' Zürich, 1828, 2 vols. 8vo. This collection is extremely useful, but it is to be regretted that the editor has not always published the inscriptions with the 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 archaeological 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 the want of a new and complete collection has long been felt. Mr. Kellersmann, who has lived in Italy for some time, formed the plan of publishing a collection of Latin inscriptions similar to the 'Corpus Inscriptionum Graecarum' of Boeckh, but he died suddenly in 1843, before carrying out his plan. O. Johannes, who has passed his life in Italy, has formed a collection of all the known Latin inscriptions has recently been held out. On the 6th of July, 1843, Villenave, the French minister of public instruction, requested the Academies of Inscriptions and Archaology 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 arrangement 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 importance: Zaccaria, 'Institutiones Lapidariae,' Rome, 1770, and Venicis, 1792; Morcelli, 'De Stilo Inscriptionum Latinarum Liber Tertius,' Rome, 1751, and reprinted in his 'Opera Epigraphica,' Patavii, 1819, 5 vols. 8vo.; Kopp, 'Palaeographica Orbis,' Munisthal, 1829, 6 vols. 8vo.; 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 a few number of well-verified instances (for instance in the beds of Aix in Provence) among lacustrine tertiary strata, or (as at Stonesfield in Oxfordshire and Solenohem in France) amongst marine oolite beds. But Mr. F. West with has added trees of coleoptera from the coal formation of Coalbrook Dale, and Mr. Strickland parts of neopterygia from the lips of Warwickshire; Dr. Buckland obtains neopterygia from the coalite of Stonesfield, and Mr. Brodie portions of insects belonging to various natural orders from the lips of Somersettshire, and of the limestone of the Vale of Wadour in Wilts, and the Vale of Aylesbury.

Still the number of fossil insects, whether we estimate individuals or species, is very small compared to the probable numbers which must have existed during a period of time so long. It is not improbable that a circumstance quite explicable by reference to the phenomena which are now taking place in nature; for, instead of 12,000 British species of insects there is reason to believe that but a very small proportion of the number have been created in the estuary, or marine depots now in progress. Only one eflytr of a small beetle was observed in a deposit of the Elephantoidea era in Yorkshire, and one seed of some umbellate plant, along with hundreds of shells which inhabited the lake.

No doubt vast numbers of insects, wandering by caprice or drifted by winds, pass from the shore and fall in the basins we learn from the first voyage of Cook, who sailed through myriad of insects, some on the wing and others in the water, 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 ocean. In like manner we find land insects hamped in profusion by winds on certain tracts of fresh water, and borne down the course of rivers by the sediments, the arching of the salt or fresh waters, or the drift of the estuary of the Wealden deposits, and in the tertiary accumulations of Aix, Oeningen, and Avignon. In the latter region, the subterranean cavities gathering on the intrusion of lavan or lava-cases of Phryganias have caused the formation of a peculiar limestone ("Iudialis Limestone").

In the following summary of the groups of fossil insects in Britain, the most recent stratifications come first. The catalogue commences with the Linnean era, the modern authorities and localities are given for each case. (See Morris's Catalogue of Fossils; Brodie's Fossil Insects; Lyeil, in Geol. Pro.; Phillips, Geol. Yorkshire, etc.)

1. Ostracous fresh-water deposits (Pleistocene).
   Elytron of a Chrysocera, Bellocia, in Yorkshire, (Phillips.)
   Remains of Copris lunaris. Mundesley, Norfolk. (Lyell.)
   " Donacia."
   " Gephyra.
   " Libralia."
   " Atherhas. Southwold, Suffolk. (Alexander.)
   (No true aquatic beetle is mentioned among these. Donacia haunts aquatic plants. The others are strictly terrestrial. They must have been drifted into the lakes in which the Plaenobia, &c. lived.)

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

3. In the Wealden strata of the Vale of Wadour (found by Mr. Brodie and transcribed by Mr. Wasson.)
   Aquatic Coleoptera of the families—Hydrophilidae? Diptera? (Colymbetidae.)
   Orthoptera, of the generas Achatia and Blata.
   Hemiptera and Homoptera, including land tribes, &c.,—Cicadina, Cicada, Corea, Larva., Aphides, &c., and the aquatic species of Vesu and Hydromyctera.

Neopterygia. In this water-bathing order occur Libellula and Zoelona, Corydalis, Libellula, Termes, &c. and Lepidocerae.

Trichoptera of Phryganias ?


4. In the olites strata, insects occur in the laminated earthy limestones of Stonesfield and similar localities in Gloucestershire and near Bath. Dr. 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 Neoptera. The following is abstracted from Mr. Brodie's list.

Coleoptera, of the families Prionide, Buprestide, Filicole,
ranean, *Brentus*, mainly confined to the tropical regions of both hemispheres; *Apion* and *Rhyphocheta*, chiefly European. The distribution of the species of weevils depends in a great measure on that of their host plants.

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 the family Cucujidae, twenty are of extensive distribution, and others are limited to the northern temperate regions. Others have defined centres, as *Clytus* in Europe, *Trachydera* in South America.

Of the Chrysomelidae, the typical genus Chrysomela is confined to the northern temperate regions. The distribution of certain plants determines the distribution of the species. From this cause, species of limited distribution are sometimes multiplied far from their aboriginal centres. Thus *Galeruca californica*, 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 larvae, and probably they will henceforth become a constant annoyance in the New World. *Lema* 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 Trigidae, *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. Many of the distinct genera of *Locust*, *Anacridium*, and *Acheta*, the grasshoppers and crickets, are found in most countries. The *Locusts* are mostly exotic. The strange *Phasme* are mostly tropical, as are also the greater number of the *Locustidae*. The wood-locusts, *Blatta*, are very general, and have been greatly diffused from their original centres by unintentional human agency. The weevig tribes, *Phyllophaga*, including more than fifty species, are in great part European, but range even to Van Diemen's Land.

Erichson notices the curious fact respecting the Orthoptera of Van Diemen's Land, that only one fourth of the species are winged and capable of active flight.

Neuroptera.—The number of known species in this order is short of one thousand. The section of *Placopenne* is almost entirely European; the genus *Macronema*, including species from Madagascar and Brazil, is an exception. The *Placopenne*, a great part of the genera of which division are now considered by many naturalists Orthoptera, have a much more varied distribution. Thus the *Myrmeleontidae* are cosmopolitan, the *Pterio* and *Nemoura* chiefly European, the *Pteropoda* characteristic of the temperate regions of both the old and new world, the *Periptera* of the tropics. In the section of *Scleruridae*, the *Ephemeroptera* are European; the *Aeshnidae*, comprising the families of *Aeshna*, *Libellula*, *Anax*, and *Aeschna*, to which near two hundred species are known. Other allied genera are more limited.

*Hymenoptera.*—Among the sting-bearing species, the true bees are by far the most important, these now dispersed in America having been transported from Europe. The genus *Centris* and *Euglossa* are exclusively American. *Nothocordylos* is south African. *Andrena*, *Xylocopa*, and several other extensive families are cosmopolitan. *Astrapia*, a great many genera of wasps are peculiar to South America. The ants are most developed in Europe. *Bembix* is a tropical genus. The terebrating Hymenoptera are both very numerous and widely distributed, especially the great genus *Ichneumon*. Certain genera forming the family *Oxyra* are exclusively European, as are also a great part of the numerous family of *Ostcalates*. *Cynipus* is European, and the greater number of *Tetraneura*.

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

When 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 for the most part confined to the tropical regions. Some of them possess great ranges. Thus certain species of *Pieris* are found over all Europe, and great part of Asia and Africa. Other forms are constant to mountainous regions. Of the *Nymphalidae* the most extensive are the tropical ones. In this family there are some remarkable instances of extensive distribution of species. Thus *Vanessa Cardia* (a common British butterfly) is found in every part of the world, and *Vanessa Atalanta* is a familiar sight in every part of Asia, Africa, and to North America. In the remaining tribes the typical genera are almost always cosmopolitan, whilst others have more limited areas.

The *Sphingidae* and *Zygopidae* are in great part European; the *Gastropidae* are cosmopolitan.

Among the moths, the *Phalena* are chiefly European, and the species are usually widely distributed. This appears to be the case also with the other families of Nocturnal Lepidoptera. Of these we have as yet no extensive knowledge of exotic forms, than because it is really so, for we find types and species in distant regions wherever they have become accidentally introduced, as in the instance of Asiatic Russia, where the researches of recent years among these insects have brought many new forms to light.

*Diptera.*—One-half of the described species of two-winged flies (about eight thousand) belong to Europe. This disproportion arises from our comparative ignorance of the exotic species. The small group of *Ornithomyzidae*, 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 *Musciidae* include a great number of genera, both European and exotic, the former being most prolific in species, some of which have wide ranges, and 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 Pacific; *Tabanus* is more widely distributed. *Ommatius*, a genus of *Asilidae*, has its members in all parts of the world. A great many genera are peculiar to South America, and several to Africa, hot, woody, and moist regions being specially the abode 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*. *Oxylus* is generally distributed.

*Hemiptera.*—Of the two great divisions of this order, the *Hemiptera* and the *Heteroptera*, the first is the smallest and also the most tropical. The distribution of the insects corresponding to the tree species that form the fauna and flora of the countries they inhabit. Thus each species of *Coccus aphid* has a range correspondent to that of the plant upon which it feeds; and of the *Coccidae* and *Lopadinae* with the presence of their favourite animal food. Among the most interesting of the families of *Hemiptera* are the *Cicadidae*, of which the genus *Tettigonia* includes 200 species, centred in America, but having members also in the Old World; the *Peloridea*, or *Lantern-flies*, very generally distributed through warm climates; *Scutelleria*, 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 *Aphididae* the *Vasconia* are cosmopolitan, *Palorus* and *Nectonemia*, mostly European; *Galbus* and *Mononyx*, American; and *Holobotes*, equatorial.

*Thysanura.*—Yet the distribution of these minute insects has been less extensively determined. The more typical range from Europe to China. *Padura* and *Sphingida* 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 Dennys and Gwilt. Their distribution corresponds with that of the animals upon which they are found. Of the equally annoying order *Aphaniptera* 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, 1849, to August, 1845, three acts have been passed relating to insolvent debtors; these are 5 & 6 Vict. c. 116; 7 & 8 Vict. c. 96; and 8 & 9 Vict. c. 127.

The acts are & 6 Vict. 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 3000l., to present a petition to obtain an order of the court to make an order for bankruptcy in London or the Commissioners of the District Courts of Bankruptcy in the country, from all process whatever (except under a judge's order), either against his person or property unless they are prior to the order. If the interim of the insolvent's property was vested in an official assignee appointed by the court. If, on the hearing of the petition, the commissioner was satisfied with the allegations which it contained, and there was not a 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 in aid of his assignees, together with an assent 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 Assignments, to provide for such cases as may be committed to court for adjudication under an order of court, and to provide for a pecuniary security for the purposes of such orders; and for such purposes as to the said order may be annexed; to provide for the ascertainment of the title of the said debtor; and to extend the jurisdiction of the courts for the recovery of debts in insolvency cases.'

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 (§ 5 & 6 Vict. c. 116), any property whatsoever, or retain or exempt out of such schedule any wearing apparel, bedding, or other necessaries, property of greater value than 20L, any debtor, upon conviction, be liable to be imprisoned and kept to hard labour for any period not exceeding three years.

The act 7 & 8 Vict. c. 96, made a great alteration as to debts under 50L. of the 57th section of W. Wilberforce Act of 1840, which was in 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 of the Majesty's superior courts, 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 interest and costs of action; and the said 57th section is hereby repealed so far as it relates to debtors of the value of 20L and upwards, whereby the act 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 as is mentioned in section 57, shall have been obtained, all persons in execution at the time of passing this act be discharged, when the debt, exclusive of costs, did not exceed what is specified in the 57th section. Accordingly, such persons, on making application pursuant to the 56th section of this act, were discharged from prices in England and Wales.

The consequences of the legislation contained in the 57th and 58th sections of 7 and 8 Vict. c. 96, were those. All persons who were in confinement for debts under 20L, exclusive of costs, might get their liberty; but the judgment upon which the debtor was taken in execution remained in force (§ 58.), and the judgment creditor or creditors had their remedy and power to do whatever was necessary to enforce the property of the debtor, just as they might have had if he had never been taken in execution upon such judgment. The 58th section gave to the judge who should try such cause (§ 58), power to order the insolvency or bankruptcy of the debtor, and power to imprison the defendant (depositor) 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 58th 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 England and Wales. 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. may never come into court, nor be the subject of any judgment or execution. In many cases give credit to persons who have no reasonable means of payment, and with whose character and condition they are imperfectly acquainted. Many persons are always in the position of debtors for the recovery of debts; and in the hands of non-professional creditors or those who are not familiar with the consequences of non-payment. A third class, which we hope may be the most numerous of all, is willing to pay, but often requires time, and must be deprived of many comforts if they do not continue to pay their creditors and earnings fairly entitle them to. [Carruth, 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 indebted for sums under 20L. to the recovery of their debts 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 is the great alteration which the act made. In the case of debtors 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 seized is not to punish him as a debtor, but that he may be sufficiently restrained by a complete execution 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 of the debt. The simple fact of being seized and unable to pay or not would not be punished. The contracting debts under such circumstances as amount to fraud ought to be punished. The principle then which should guide a legislator 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 has paid his debts or 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 has also relieved many small traders and debtors from the act, in order to secure the person of their debtor until he has paid his debts or made a full and honest statement of his means of payment.

The legislature have now remedied the mischief which they have created by a new act, called the 8 & 9 Vict. c. 127, which gives to creditors the means of obtaining payment except by an action in one of the superior courts, in which case the creditor would have to pay the costs out of his own pocket, and in the end might be unable to obtain satisfaction for the debt. Many tradesmen had debts in sums of less than 20L. which in the aggregate amounted to a large sum, perhaps in some cases to 2000L. or even 3000L. in some of the provincial towns. The aggregate amount owing in sums under 20L. was not less than 100,000L.

The act 8 & 9 Vict. c. 127 gives to creditors the means of obtaining payment either by an act of bankruptcy, or by an act of insolvency, or by an act of bankruptcy and insolvency, or by a petition for the recovery of debts in insolvency cases. The powers of the act extend to debts of a value of 20L. and upwards.

The act (8 & 9 Vict. c. 127) gives to creditors the means of obtaining payment of sums under 20L., besides the costs of suit, by the following process:—A creditor who has obtained judgment, or order for the recovery of any debt, whether exclusive of costs, may summon his debtor before a commissioner of bankruptcy; or he may summon his debtor before any court of requests or consistory, or inferior court of record, or the judge or barrister-at-law, a special pleader, or an attorney of ten years' standing. It may here be remarked that this part of the act which takes the jurisdiction of the courts of bankruptcy and of other courts over the matters of insolvency is a new provision.

The judges of these courts are made removable for misconduct or disqualification, and the courts will be assisted in some degree to the bankruptcy and insolvent courts.

On the appearance of the debtor before the commissioner or court upon summons, he will be examined by the court,
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 previous contracts, etc.' and 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 the satisfaction of the judge that the debt is not due, the court shall have willy-nilly 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 a commissioner, as may be directed by the court, shall by an order in writing, in the way above stated, arrest the defendant, and imprison him for forty days; but such imprisonment will not operate in satisfaction of the debt. Wearing apparel and bedding of a judgment debtor, and the implements of his trade, amounting in the whole to a sum not exceeding 2l. 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 similar court in the same town. When a debt exceeds the suit may be removed by certiorari 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 authorises the provisions of resolutions where sums not exceeding 2l. could heretofore only be recovered, and now sums not exceeding 20l. may be recovered in small debt courts by the act that all suitors' money paid into court and not claimed by the time specified by this act is to go into a fund for the payment of the necessary expenses of carrying on the business of the court.

The regulations of the 7 & 8 Vict. c. 06, as to debts under 20l. caused universal dissatisfaction among creditors in England and Wales, as we have already observed. The evidence taken before the Lords' Committee in 1846 proved the necessity of this act. The Judges Olympic in all countries have an unreasonable legislation and of its correction is useful. It shows how ill-considered measures sometimes become law in this country, in which the mass of public business is so enormous. The act is to extend five years, and is to be renewed by Parliament, and is to contain a provision 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 creditor, 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 petitioning 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 20l., shall assent to the proposition of the debtor, the proceeding is to be supported by a statement in writing of the creditors in number and value, or nine-tenths in value, or nine-tenths in number of those whose debts exceed 20l., and the meeting of creditors is to be unanimous, and that the arrangement made 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 bankruptcy.

The great arguments in favour of 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 appointment of the committee, but 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 knowledge of the relations of creditor and debtor 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 executed 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; for when the sheriff goes to seize it, he finds it has been secreted already. If the security is a mere bill of sale, and frightens 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 any difficulty in the terms of the judgment, the question is, 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 the imprisonment 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 it, 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 property of the defendant, that the court has declared it to be his duty to require of the creditor by record the establishment of any further case, in order to entitle him to an execution. His judgment is his case: the clearest duty lies on the other party to establish his exemption from the task of satisfying it. The great argument of the Report from which Mr. Law dissents is this: that all execution against the person presumes the value of the debt. The greatest argument is, that the question ought to be against the debtor who does not obey the judgment of the court. He may be guilty of fraud or he may not: it is his business to explain why he discloses the property, if the order is not made on sufficient cause. The 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, poorly.
for the purpose of ascertaining whether they are dishonest or not. I am quite sure that in that court (the Insolvent Court) where searching inquiry is known and practised, it is found necessary to 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. The 2r has $x^2$ for a primitive function, and also $x^2+C$, 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 find in 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 $x(1-x)^{-1}$ both occur as the primitives 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:

$$\int dx, \int f(x) dx = \frac{x^2}{2} + C$$
$$\int f(x) dx = \frac{x}{c}$$
$$\int f(x) dx = \cos x, \int f(x) dx = \sin x$$
$$\int f(x) dx = \tan x$$
$$\int f(x) dx = \sec x$$
$$\int f(x) dx = \csc x$$
$$\int f(x) dx = \cot x$$
$$\int f(x) dx = \sec x \tan x$$
$$\int f(x) dx = \csc x \cot x$$

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:

$$\int f(x) dx = \frac{x}{c}$$
$$\int f(x) dx = \frac{x}{c}$$

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 $f(x)dx$ to another form $vdx$, in which $v$ is a different variable. Thus $f(x)dx$ can be immediately reduced to $\int f(x)dx + C$. 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 recognising them at sight. Sometimes a slight transformation is required, thus: $(1+\alpha/x)^{-1}dx$, when reduced to $(1+\alpha/x)^{-1}dx$, which is $\int (1+\alpha/x)^{-1}dx$ clearly shows the form $v^{-\alpha}dx$, where $v = x^{-\alpha}$.

2. The reduction of algebraical to trigonometrical functions, and the converse. Thus $(a-x)^{-1}dx$, if $x$ be made a $\sin \theta$, becomes $a \cot \theta + C$. 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 recognising them at sight. Sometimes a slight transformation is required, thus: $(1+\alpha/x)^{-1}dx$, when reduced to $(1+\alpha/x)^{-1}dx$, which is $\int (1+\alpha/x)^{-1}dx$ clearly shows the form $v^{-\alpha}dx$, where $v = x^{-\alpha}$.

3. When rational powers appear in a denominators, they
should be transferred to the numerator by changing \( z \) into \( 1: z \). By such a transformation, we change \( \frac{dx}{\sqrt{a+bx+cz^2}} \) into \( \frac{r^{m-1}ds}{\sqrt{a+bx+cz^2}} \).

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

\[
J = \frac{\int a dx}{\sqrt{(a+bz+cz^2)}}
\]

the first term of which can be integrated as in (1), leaving the second term, which can be simply integrated.

5. The process known by the name of integration by parts, consists in reducing the form \( J \int dx \) into an arbitrary form \( \int x dx \), and using the obvious theorem

\[
J \int f(x) dx = \int f(x) dx - J \int f'(x) dx
\]

the finding of the first integral is reduced to that of finding the second integral, which may often happen is the more simple of the two. Thus to find \( \int e^x \log x \) we have

\[
\int e^x \log x \, dx = \int e^x \log x \, dx - \int e^x \, dx
\]

about the second term of which there is no difficulty. But it often happens that this method succeeds by a succession of reductions. Thus it gives

\[
f(x) \, dx = x^a - \frac{1}{a} f(x) \, dx
\]

in which the second term must be again treated in the same manner.

6. 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 \( \int f(x) \, dx \) be considered as a function of \( n \), and called \( V_n \), integration by parts gives

\[
V_n = a^n x^a - na^{n-1} V_{n-1}
\]

thus showing how to find \( \int f(x) \, dx \) as soon as \( \int f(x) \, dx \) is known.

7. 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 at last come to \( \int f(x) \, dx \) or \( \int f(x) \, dx \) which is known. But if \( n \) were a fraction, no function of the value of \( n \) at a time would lead to an integrable form.

8. 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 \( V_n = \int \left( f(a-x) - \frac{1}{n} f(a-x) \right) \) has for its reduction of equation

\[
V_n = - \frac{x^{n-1} f(a-x)}{n} + \frac{1}{n} f(a-x)
\]

Accordingly, when \( n \) is even, we are brought at last to \( V_n \), and when \( n \) is odd, to \( V_n \), or to \( \int \frac{1}{n} (f(a-x) - a) \) and \( - \int (f(a-x)) \). 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 \( \int \frac{f(x)}{\sqrt{(c+bz+cz^2)}} \), the equation of reduction being

\[
\int \frac{f(x)}{\sqrt{(c+bz+cz^2)}} = \frac{1}{a} \int \frac{a f(x)}{\sqrt{(a+bx+cz^2)}}
\]

we should proceed as follows:

\[
\begin{align*}
V_0 &= f(x), & V_1 &= a f(x) - f(x) \\
V_2 &= a^2 f(x) - 2a f(x), & V_3 &= a^3 f(x) - 3a^2 f(x) + 2a f(x) \\
& & V_4 &= a^4 f(x) - 4a^3 f(x) + 12a^2 f(x) - 24a f(x) + 24 f(x)
\end{align*}
\]

11. There are several cases in which the following extension of the theorem known by the name of John Bernoulli may be used to advantage. \( a', a, b, c \), be the successive differential coefficients of \( u \) with respect to \( x \), and let \( v_1, v_2, v_3, \ldots \) be the successive integrals of \( x \) with respect to \( x \) then

\[
\int f(u) = x_1 v_1 + x_2 v_2 + x_3 v_3 + \cdots \pm \left( x_1 v_1 + x_2 v_2 + \cdots \right) \frac{x_m}{(m+1)!} f^{(m+1)}(x_m) \, dx.
\]

This is particularly useful when \( a \) is a rational and integral function, and \( u \) is successively integrable with respect to \( a \), in a manner similar to the process in Ex. 100. Ex. 100, Ex. 101, and Ex. 102. It may then be continued until the result is obtained.

12. In the case of \( \int f(x) \, dx = \int \frac{dx}{x} \), when \( x \) are rational and integral functions, the integration is always possible as soon as all the roots of \( x \) are found. The process in Ex. 100, Ex. 101, and Ex. 102. It may then be continued until the result is obtained.
Let $V_a = \frac{m}{a}$ and $V_b = \frac{n}{b}$ in the preceding formulae.

If $m$ and $n$ are of the same sign, the formulae are most commonly used.

The preceding formulae involve the functions $\sin n$ and $\cos n$, the integral form of which is given by

$\int \sin n \cos n \, dx = \frac{\sin (n-1) \cos (n-1) - \sin (n+1) \cos (n+1)}{2(n-1)}$.

If $m$ and $n$ are of opposite signs, the formulae are also most commonly used.

Let $X = \frac{m}{a}$ and $Y = \frac{n}{b}$, then

$\int \sin m \cos n \, dx = \frac{\sin (m+n) \cos (m-n) - \sin (m-n) \cos (m+n)}{2(m-n)}$.

For $m$ odd and $n$ even, the formulae are also most commonly used.

Let $X = \frac{m}{a}$ and $Y = \frac{n}{b}$, then

$\int \sin m \cos n \, dx = \frac{\sin (m+n) \cos (m-n) - \sin (m-n) \cos (m+n)}{2(m-n)}$.
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\[ \frac{1}{(m-1)s^{m-1} + n-1} \int \frac{dx}{s^m + x^n} = \frac{c^{-1}}{(n-m)s^{n-m} + n-n} \int \frac{dx}{s^n + x^n} \]

\[ \int \frac{dx}{s^m + x^n} = \frac{1}{(m-1)s^{m-1} + n-1} \int \frac{dx}{s^m + x^n} \]

\[ \int \frac{dx}{s^m + x^n} = \frac{1}{(n-1)t^{n-2} - m-1} \int \frac{dx}{s^m + x^n} \]

\[ \int \tan^n \vartheta \, d\vartheta = \frac{\tan^{n-2} \vartheta}{n-1} - \int \tan^{n-2} \vartheta \, d\vartheta. \]

We have given the last steps in various forms, because in fact all the integrals of the form \( \int \frac{dx}{(a^x - b^x)^2} \) depend upon them. For \( \pi = \sin \theta \), the last integral becomes

\[ -a^{n/2} \sin^2 \theta \, d\theta. \]

We have now given most of the forms which will be useful in the ordinary work of reference. Further forms and examples will be found in many works on the integral calculus, but the largest collection is in Euler Hirsch's 'Integraltafeln,' Berlin, 1910, 4to, a work of which there is also an English edition.

We have noticed a great many such forms as \( \int \frac{dx}{a^x + b^x}, \int \frac{dx}{a^x - b^x}, \) etc. which are little used, except in particular cases. When \( a = b \), these forms can be integrated, it follows that \( \int \frac{dx}{a^x + b^x} \) and \( \int \frac{dx}{a^x - b^x} \) can also be integrated, since the second can be made into the sum or difference of two functions of the first kind, by putting for \( a \sin \theta \) or \( \sin \theta \) 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

\[ \frac{dy}{dx} = \int \frac{dy}{dx} \, dx. \]

If therefore \( \int \frac{dy}{dx} \, dx \) can be found, so also can \( \int \frac{dy}{dx} \, dx \) if \( y \) be not a function of \( x \). From this it will be seen that whenever \( \phi(x) \) is an integral so can \( \phi(x) \, dx \), which is obtained by \( n \) differentiations with respect to \( a \) and also that whenever \( \phi(x) \, dx \) can be integrated, so can \( \phi(x) \, dx \), which is obtained by \( n \) differentiations with respect to \( \int \phi(x) \, dx \) for \( \int \phi(x) \, dx \) being an integral [Napierian].

Functions involving the transcendental forms \( \sin_x \phi, \phi_x \), etc. can sometimes be reduced to more algebraical forms by integration by parts. Thus,

\[ \int V \sin^n X \, x \, dx = \int V \sin^n X \, dx \ablX^a \]

\[ \int V \log X \, dx = \int V \log X \, dx \ablX^a. \]

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.]; but not possible to find the integral in all cases. If we can integrate \( \phi(x) \, dx \) generally, that is, if we can find the function \( \phi(x) \), of which \( \phi(x) \) is the differential coefficient, we can always express the integral, the limit of the summation in the article just referred to, as follows:

\[ \int \phi(x) \, dx = \phi(b) - \phi(a). \]

It frequently happens that \( \phi(x) \) 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 those 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 to do, and which has words which cannot be translated, we adopt the words of that language into our own. Precisely the same thing is done in the case of definite integrals. Thus in factorials, P. C. S., we adopt the integral \( \int e^{-x} \, dx \), as the fundamental mode of expression for a function till then inexpressible, which becomes \( \int e^{x} \, dx \) whenever \( x \) is an integer, and remains intelligible, though not very easily found, when \( x \) 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 \( e^{-x} \) 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

\[ \int e^{x} \, dx = \int e^{-x} \, dx + \int e^{x} \, dx. \]

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 \( e^{x} \, dx \) 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 to have happened, it had only been necessary to know the logarithms and their properties; so that \( e^{-x} \, dx \) is seen to be the logarithm of \( x + c, \) and \( e^{x} \, dx \) is the logarithm of \( x + c, \) throughout this article being Napierian. But we are not equally ready for \( f(x) \, dx \), or for \( f(x) \, dx \) (except when \( x \) is a integer) or for \( \cos x \, dx \), 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, \( \frac{du}{dx} = a \, dt. \)

The general solution of which cannot be expressed in finite terms. It will easily be seen that \( C \, e^{x+a} \) is a solution for any value of \( C \) and \( \psi \), provided only that \( \mu = \psi \), and also that the value of \( C \) is such that \( \psi \) is a solution. Hence we assume an indefinite number of such terms, giving to \( C \) the form \( \psi \), and summing them with such values of \( C \) as will make the whole represent

\[ \int \psi \, dx. \]

and we then see that this integral is a solution or general value of \( u \), whatever the function \( \psi \) may be, and whatever may be the values of \( C \) and \( \psi \). By a reduction which is rendered easy by some of the results presently mentioned, this solution is thrown into the form

\[ u \, = \, \int \psi \, (x + 2 \sqrt{a}) \, e^{x+a} \, d\psi. \]

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 the 'Cambridge Mathematical 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 treatises, for which the mathematical reader may also wish to refer. In order to avoid risk of broken or dropped letters, in an article in which the correct printing of the limits is the utmost importance, we shall print what is usually denoted by \( \int \phi(x) \) in the following way, \( f \phi(x) \int (a, b) \). Any conditions as to the values of constants will be expressed before the integral.
INT

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:

\[
(m+1 < n) \int x^{m-1} e^{nx} \, dx = \frac{x^m}{m n^{m-1}}.
\]

\[
(m + 1 < n) \int x^{m-1} \cos nx \, dx = \Gamma(m+1) \frac{1}{n(m-n)}.
\]

There is a class of multiple integrals closely connected with factorials, which may be made to save much trouble in applications to geometry. We shall take three variables as a specimen, but the same formula may be written with any number. The triple integration being made for all positive values which give \( x+y+z \) exceeding 1, we have (a, b, c, being positive)

\[
\int_{x=1}^{x=a} \int_{y=1}^{y=b} \int_{z=1}^{z=c} f(x+y+z) \, dx \, dy \, dz.
\]

Similarly, the condition being that

\[
(\frac{z}{x})^{\frac{1}{a}} + (\frac{y}{x})^{\frac{1}{b}} + (\frac{z}{x})^{\frac{1}{c}}
\]

shall not exceed 1, we have

\[
\int_{x=1}^{x=a} \int_{y=1}^{y=b} \int_{z=1}^{z=c} f(x+y+z) \, dx \, dy \, dz
\]

It is advisable to study the factoring of the integrals and the use of the properties of factorials in the reduction of definite integrals, as the following:

\[
\pi^{\frac{1}{4}} \Gamma(\frac{1}{2}) \Gamma(m+1) \Gamma(\frac{1}{m})
\]

We shall now give some specimens of the results of functions involving trigonometrical quantities. One of the most important of this class is the following:

\[
\int_{x=0}^{x=\infty} \sin nx \, dx = \frac{1}{n} \sin nx.
\]

According as \( b \) is positive or negative.

\[
(\text{a positive}) \int_{x=0}^{x=\infty} \cos nx \, dx = \frac{1}{n} \cos nx.
\]

\[
(\text{b positive}) \int_{x=0}^{x=\infty} \sin nx \, dx = \frac{1}{n} \sin nx.
\]

from these come

\[
\int_{x=0}^{x=\infty} \cos nx \, dx = 0, \quad \int_{x=0}^{x=\infty} \sin nx \, dx = 1.
\]

and from these come two equations which have been much used, long before they were openly expressed, and which exist in the last twenty years.

When \( a \) and \( n \) are both positive

\[
\int_{x=0}^{x=\infty} \cos nx \, dx = \frac{1}{n} \sin nx.
\]

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 \( \alpha \) are both positive

\[
\int_{x=0}^{x=\infty} \cos nx \, dx = \frac{1}{n} \sin nx.
\]

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 \( \epsilon^{n} \) the hyperbolic cosine and \( \phi \) the hyperbolic sine, and denote them by \( \cosh \) and \( \sinh \), we have, the limits being \( 0 \) and \( \infty \), and \( a \) being less than \( x \),

\[
\int_{x=0}^{x=\infty} \cosh nx \, dx = \frac{1}{n} \sinh nx.
\]

\[
\int_{x=0}^{x=\infty} \sinh nx \, dx = \frac{1}{n} \cosh nx.
\]

\[
\int_{x=0}^{x=\infty} \cosh nx \, dx = \frac{1}{n} \sinh nx.
\]

\[
\int_{x=0}^{x=\infty} \sinh nx \, dx = \frac{1}{n} \cosh nx.
\]

The integral \( 4 \pi \int_{x=0}^{x=\infty} \sin nx \, dx \) is the nth number of Bernoulli (NOMBERS OF BERNULLI, P. C.), meaning that opposite to which \( m \) was written in the article cited.

As specimens of the reduction of definite integrals, the integrals

\[
\int_{x=0}^{x=\infty} \cos nx \, dx \quad \frac{1}{1 + x^2}
\]

are severally equal to

\[
\frac{\sin \phi}{\phi} \int_{x=0}^{x=\infty} e^{-\alpha x} dt \quad [x > a, \alpha > 0]
\]

The following is fundamentally important,

\[
\int_{x=0}^{x=\infty} \cos nx \, dx = \frac{\sin \phi}{\phi} \int_{x=0}^{x=\infty} e^{-\alpha x} dt.
\]

With regard to these equations, it must be observed that they are not to have their algebraical consequences; thus, \( a \neq 0 \), but \( a \neq 0 \). The true meaning of these equations is: as \( x \) becomes infinite, sine becomes insensible, in form, by the angle \( x \) becoming infinite, is properly represented by \( \sin x \) of \( x \).
The integral \( \int \frac{dz}{\log z} \) [0, e] has been tabulated \[\text{[Diff. Calc., L. U. K., p. 662]}\] by Soldner, and a great many integrals may be found from it. Soldner proposes to call it the **Logarithm-integral of \( \alpha \)**, and to denote it by the abbreviation \( \text{li} \). Adopting this notation, we have then, both in definite and indefinite forms,

\[
\int \frac{dz}{\log z} = \text{li}_z.\]

and so on.

Of miscellaneous integrals there is an immense number, of which we give a few instances:

\[
\int (1-x^n)(1-x^{-n}) dx = \frac{1}{n} (1 + x^n) + C.
\]

and other instances.

Further, the equation

\[
\phi(x) = \phi(x) + \frac{1}{\cos \omega} \cos (x \cos \omega) = \frac{1}{\cos \omega} \cos (x \cos \omega) + C
\]

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 \( +\infty \), we write \( a \) and \( b \), a being less than \( b \), then

\[
\phi(x) = \frac{1}{\cos \omega} \cos (x \cos \omega) + C
\]

is a discontinuous function, as follows:—From \( x = -\infty \) to \( x = a \) inclusive, it is nothing: when \( x = a \), it is \( \phi(x) \); from \( x = a \) to \( x = b \) both exclusive, it is \( \phi(x) \); and from \( x = b \) to \( x = \infty \) it is nothing.

The above methods of expanding a function in series of sines and cosines has been extensively used by Le Grange, Poisson, and Fourier. We give it in the most general form after the manner of Poisson. Let

\[
\phi(x) = A_0 + A_1 \cos \frac{x}{\pi} + A_2 \sin \frac{2x}{\pi} + \ldots
\]

and for every value of \( x \) from \( x = 0 \) to \( x = 1 \), both inclusive, this equation is true if

\[
A_0 = \frac{1}{\pi} \int_0^1 \phi(x) dx, \quad A_1 = \frac{2}{\pi} \int_0^1 \cos \frac{2\pi x}{\pi} \phi(x) dx
\]

Again, the equation

\[
\phi(x) = B_1 \sin \frac{x}{\pi} + B_2 \sin \frac{2x}{\pi} + \ldots
\]

is true from \( x = 0 \) to \( x = \pi \), both exclusive, if

\[
B_1 = \frac{2}{\pi} \int_0^\pi \sin \frac{\pi x}{\pi} \phi(x) dx
\]

and further, the equation

\[
\phi(x) = A_0 + A_1 \cos \frac{x}{\pi} + A_2 \cos \frac{2x}{\pi} + \ldots
\]

is for all values of \( x \) from \( x = a \) to \( x = b \), both inclusive, (becoming \( \psi(x) \) when \( x = b \)) if

\[
A_0 = \frac{1}{2\pi} \int_0^\pi \phi(x) dx, \quad A_1 = \frac{1}{2\pi} \int_0^\pi \cos \frac{2\pi x}{\pi} \phi(x) dx
\]

But write \( 2\pi \) instead of \( \pi \), in the limits only, or write \( [0, \pi] \) instead of \( [0, \pi] \) and the equation becomes true for all values of \( x \) from 0 to \( 2\pi \), 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 \( \psi(x + y - 1) \) vanishes when \( x = \infty \) or \( -\infty \) whatever \( y \) may be, and when \( y = 0 \) 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 \( \phi(x) \) (\( x \) = \( 0 \) 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

\[
\phi(x) = \frac{1}{\cos \omega} \cos (x \cos \omega) + C
\]

from \( x = -\infty \) to \( x = +\infty \), and from \( x = 0 \) to \( x = \infty \). Or thus:

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 difference 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 which assum-
companies use of divergent series, which is the most important
calculational question now under discussion. If we were to
set out the three fundamental laws of all such series, we
should find that divergent series would one day take their undisputed place among
what is understood about objects of analysis, as negative quanti-
ties and their logarithms, imaginary quantities and their
exponential expressions, fundamental orders of infinity, and
discontinuous solutions of differential equations, &c. They
have successively done, each under a fire of objections which
has well served the progress of science, by the defensive
researches which it has rendered 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
difficulties exist: the proposition excites those who are against
any rejection of the symbols, and yields, in their defense and
discrimination, all that their difficulties propose; and if they only had 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
may be inferred from all the points of difficulty of which we have spoken, it may be said, in the words of Horace

*Naturam expellas fera tamquam error*

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 ex-
pected that the difficulty will be completely resolved, with
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 is obtained on the application of the party 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
informer courts, or courts of limited jurisdiction, such as
the ecclesiastical courts, from exceeding their jurisdiction. To
this end the form was frequently adopted in the late dispute
in the Church of Scotland, which ended in a success. [FAXX
Creaser, P.C.S.] Interdict is applied for by what is called
a ‘Note of Suspension and Interdict’ presented to the Lord
Ordinary on the Bills. In pressing matters, interim in-
derdicts may be granted without hearing, but in the general
case intimation is given to the other party, who gives in
answers. If there are means by which the applicant’s inte-
rests can be kept safe, as by the finding security, or other-
wise, the 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
subject of interment in large urban places, and a great amount of information has been collected. Though
opinions are not unanimous, the evidence, the further it is ex-
amined, appears to prove that emaciation from crowded burial-
places is a matter of some import in the health of persons
living, or which, indirectly, affects the health of persons
who live near them; and that these emaciations, when sufficiently concentrated may produce
speedy death. The general conclusion that all interments in
large urban places are of 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 all burying-grounds under
such regulations as may prevent the effluvia from the
dead becoming detrimental to the health of the living.
The Report to which reference has been made contains, in
addition to the evidence on the injuries caused by crowded
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
there they live, their family, their kitchen, their wash-house, their sitting-
room, their dressing-room, their sitting-room. If they have an
out-door occupation, it is frequently their work-room and their
shop. In this one room they are born, and live, and sleep,
die and amidst the other inmates.’ Among the poor in some

These are the words of Mr. A. V. Vogel, of Leaside, who has recently pub-
lished in this country a work traced to the conclusion of all is not what
published at Leaside, in his own English.
cerebrum of a suitable description ought to be provided and
maintained (as to the material arrangements) under the direc-
tion of officers duly qualified for the care of the public health.
Another is, 'that for the abatement of oppressive charges for funer-
als, marriages, divorces, and services, provision should be made (in conformity to successful cases abroad) by the officers having charge of the national ceme-
teries, for the supply of the requisite materials and services, secure
to all classes, but especially to the poor, the means of refreshment, interment, at reduced and moderate prices, suitable to the state of the deceased and the condition of the survivor.
The numerous matters contained in the Report can only be indicated here. It should be consulted by all who care in the well-being of the country.'

The Law of Nations.

It is clear that thus in its large features, as a rule for the con-
duct of independent communities towards each other, the Law of Nations wants one essential feature of that which is entitled to the term law—a binding authority, and that the provisions even in the most powerful states are not without exception a
raising hostile combinations and otherwise; but there can be no uniformity in these checks; and in general when the
interest is of overwhelming importance, and the nation powerful, it takes its own way. The importance of the questions which
may be involved in the Law of Nations thus materially affects the question how far it is uniformly obeyed. In a set of
minor questions—such as the safety of the persons of ambas-
dadors, and their exemption from responsibility to the laws of
the country to which they are accredited, and in other matters of personal etiquette, a set of uniform rules has been estab-
lished by the practice, under the influence of a common
reasoning.

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 a more apt designation than that which it superseded. When the term 'law of nations' was in use, that of law of nature did not in the
view of international law, and was sometimes employed as a synonym, and as indicative of the boundaries of the subject. It was thus in its proper
sense restricted to the disputes which governments might have
occasion to settle, and did not in the view of the subject matter
involving differences of subjects, arising out of the
position of the states with regard to each other, or out of the
internal laws of the separate states. But under the
term 'law of nations,' 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 important distinctions and exclu-
sions are avoided. Many of these subjects are interwoven,
the following instances may be taken:—A part is put in
state of blockade; a vessel of war of a neutral power breaks
the blockade: this is distinctly a question between nations, to be
settled in the court of international law, and for the law of peace,
there are any consensual rules on the subject, and the
parties will submit to them. But suppose a merchant vesselelonging to a subject of a neutral power attempts an infringe-
ment 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 smug-
gling; and it will depend on the extent to which it may result in
the judicature of that country, and not on any question settled
between contending powers, whether any respect will be
given to the bill of rights or not; and in the ground of
the sovereignty of the nation, 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 of sovereignty, which may
have been entered into or committed by nation to nation.
They arise entirely out of the internal laws of the respective
countries 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 circum-
cstances 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
been taken place in Scotland according to the law of that country;
or a habeas corpus case in Scotland, whether the child has
been taken away from its mother 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?
The three leading departments of international law are:

1. The principles that should regulate the conduct of states to each other.

2. In use, the rules that should regulate the rights and oblig-
ations of private parties, arising out of the conduct of states
to each other.

3. The principles that should regulate the rights and oblig-
ations of private parties, whose acts are affected by the separ-
ate internal codes of distinct nations.

The first of these has been the principal subject of the
well-known works of Grotius, Puffendorf, 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 subsidiarily for the
conduct of their subjects in relation to international questions.

It has been usual to call this department the 'Law of Nature,'
and an attempt has been made to reduce and moderate the
principle of its influence, though it has not the support of the authority of any legisla-
tion, it is founded on the universal principles of natural
justice.

It is clear that thus in its large features, as a rule for the con-
duct of independent communities towards each other, the
Law of Nations wants one essential feature of that which is entitled to the term law—a binding authority, and that the provisions even in the most powerful states are not without exception a
raising hostile combinations and otherwise; but there can be no uniformity in these checks; and in general when the
interest is of overwhelming importance, and the nation powerful, it takes its own way. The importance of the questions which
may be involved in the Law of Nations thus materially affects the question how far it is uniformly obeyed. In a set of
minor questions—such as the safety of the persons of ambas-
dadors, and their exemption from responsibility to the laws of
the country to which they are accredited, and in other matters of personal etiquette, a set of uniform rules has been estab-
lished by the practice, under the influence of a common
reasoning.

The Combinations for the preservation of what is called
the Balance of Power [Balance of Power, 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. The late war exhibited
a noted illustration of combination to prevent universal con-
quest on the part of the French. The safety of small states
from being absorbed by their larger neighbours, is in the
jealousy and friendship of the smaller states an aggran-
disment. Thus the balance of regulations is one barrier to
injustice. Another is public opinion; sometimes that of the
nation whose rulers would be prepared to commit injustice—
and public opinion, for the same reason, is far less likely to
be made a mere abstraction or a sentiment, than public
opinion, and is an accessory to a very limited extent that the public feeling of a despotic
injustices, 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 perpetuated
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 plan 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 act of France has taken place under a
injustice condemned by the public feeling of countries other
than those by which it was perpetrated; and it may be ques-
tioned whether the states which accomplished the partition
may not be considered, not by the French, but by the
nations like respectability in private circles, a source of
power through external support; and the conduct of Russia
and Poland has generally diverted from the former
the name of freedom of nations has been observed that the press, whether fugitive or permanent, is the
most powerful organ of this public opinion, and that the views of
able historians, jurists, and moralists, have much influence in the
progress of international law. The principal
subject of dispute in this department of international
law are—the sovereignty of territory and the proper con-
duct of states, as in the question at present under debate re-
guarding the Oregon territory in North America; questions as to discovery and first occupancy of barbarous countries; questions as to the conduct of neutrals in wars between states. In all these cases the courts have been called on to decide whether the conduct of nations towards each other, as their national honor may require, was not justified by the law of nations. In other cases the courts have been required to decide whether a case was one in which the law of nations could be applied to the conduct of nations towards each other, as their national honor may require, on a question of commercial law.

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 private rights, and, at the same time, questions of international rights; and the adjustment of each question depends on the laws of the country to which the parties, or the issues between the parties, belong. However, it is a distinct department of the subject, and its right to be regretted that the questions so far as they are not yet in a state of ready to be 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.

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this principle, treaties were lately made with France and the United States for the purpose of settling the dispute between these countries. 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 enabled to make an order to seize a person accused of a crime, a magistrate being enjoined to put in force on his being satisfied that the charge is such a nature as would authorize him to commit a person charged with the same, or with the like infinite of the laws in their own jurisdiction. Consequently, 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 civil law, our enactment and in many 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 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 Quoile, 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 as robbers who had with violent ingredients 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, and on the other hand the position of 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 and absolutely controls; 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, has the least chance of adjudicating. Between these extremes there are many questions regarding persons in their relations to each other, and regarding contracts as to movable 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 country in which the land lies, while the question regarding other property might be subjected to other criteria of jurisdiction. Perhaps historical circumstances in the early history of the European nations favored 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. Saviugy 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 and uniform territorial law. Through a series of circumstances the feudal law has been here. The Roman law became the rule principle as to persons in their relation to each other when that relation was not of a feudal character, and as to claims regarding movable goods. The common law and civil law has perforce been affiliated with the other European codes. But it has fortunately happened that those departments of the law with which international law is chiefly concerned—the constitutional 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 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 consuetudinary portions of the commercial law have done. Thus, under the old sequestration 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, for the reason of action for a debt owed 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 capable of being assigned by the law of England, Section 16 of the Bankruptcy Act, 1869, to a bankrupt in England 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 becomes entitled to all real or personal property,
ments were compounded in the laboratory by its inventor. But it is not the accident, no matter what but a discovery: we should recommend them to draw the distinction, as useful to the memory in relation to the his-
tory of their science.

The words discovery and invention a 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 atom of the earth. 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 make a lamp; and he 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 oftener than 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 confused and uncertain: the loss of documents which op-
rates 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, no claimant had ever heard of his discov-
eries 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 discov-
ery belongs. But when we come to an actual look, to the date of the publication of which there is every possible attestation.

There is one important preliminary consideration, which will, in the minds of those who for the first time give it due attention, change 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 on the waveless sea towards the distant land. In the case of Davy's lamp, it is interesting to see how the wave rippled further. When a new island is discovered in or near a fre-
quented track, as soon as a ship of one country casts anchor in a port and takes possession, it may be afterwards found in some logs that something like land had been sus-
ppected before, in others that land birds had been seen, 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, if 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 are not acquainted with its history. And this greatly enhances the merit of the most original researches, and does much to the credit of Newton that Huyghens had gone as far as to determine the conditions of circular motion, that Grimaldi had observed, and that Cavendish had measured the specific gravity of the air. That Cavalieri 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 grasp only of one. Is there then nothing accidental in dis-
covcry and invention? 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 are asked how we distinguish the person who is ready to take advantage of the one who is not, we have only the dis-
coveries to point to. We reply, that it generally happens that the persons who can thus fix a cavoury, are also those who give evidence of successful research in cases where fortune shows no special favour. It was by a mere accident that Mr. Baily [Flamsteed, P. C.; Bailey, P. C. S.] bought a house oppo-
site to the possession of a large hundre of Flamsteed's letters, and the fact that his existence came to his ears. Many people perhaps had seen them—indeed, it is not for-
granted that the contents were all in print, or been unable to judge of their value. But the life of Flamsteed is not the only one of such events. As the phenomenon of the same history: there was no accident about the editorship of the old cat-
alogues. It is said to have been by a casual effect of the sun-light 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 value less except those which happen to the person who is right in
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 is a discovery: and the greatest difficulty. The case of the steam-engine is con-
tantly under discussion; and the principal point at issue is, what is the steam-engine. Heron of Alexandria certainly produced a rotatory motion by steam, and it is sufficiently clear that he 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 a footing with that of water, we must also decide whether any except Watt has the claim. Mr. 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 settle the cases which we once; it is enough that they illustrate our point.

It may happen that in a complicated instrument or method, the perfecting of which extends over a long period, there is 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 watch, and that it is a mechanical instrument for measuring time, which would include the clepsydra, nor an application of wheel-work for that purpose, which would in-
clude the clock; but it is the use of a spring for the regu-
lator, in which we have the distinction of Watt. The next question is, did Watt observe it? or does it stem from other horologes. In a similar manner we look upon the ad-
misions made by Vieta to the mechanism of algebra as consti-
tuting the main groundwork of what now bears the name. But it would be exceedingly wrong to say that Hooke invented a watch, or that Vieta invented algebra: things done before and after both essentially belong to the ideas we mean to convey by the words. But it is not an uncommon practice of writers to strip a word of its ancient eras and carry it further. It does not seem enough perhaps) the invention so cut down to some one person, and then to clothe the word with all its most modern associations, and the favoured inventor with all the glory which ought to be divided among many. When the steam-
engine is reduced to a tesseract, or at most to a pump, it is Avery, or De Claus, or Worcester, or Newcomen, or 
Japin, &c. &c. who invented it, according to the country or the fancy of the writer; but when once the claim is established, the tesseract throws out a condenser, and the pump runs along the railroad at sixty miles an hour.

The common law of science requires that the applicant for a patent should make a distinct specification, not merely of what he intends to construct, but of that particular part of the contrivance which he claims as his own; and here a claim is made to an idea, or to the discovery of an application of the patent. [Patent, P. C.] The cases which have occurred under this law would be good study for those who write on discovery.

It may indeed happen that the amount of claim may be materially augmented by the view which the discoverer takes of his title. Columbus inferred, on true principles, the possi-
bility of crossing the Atlantic, spent the energies of a life in pro-
curing the means of making a trial, and is therefore pro-
perly and truly the discoverer of all the new world: the
Northmen who had visited it long before did not promulgate their discovery, and it might as well be given to the slorinated inhabitants of the coast that it is to us. It does not de-
preciate the merit of Columbus that he could not but suppose he should reach India or China: these were the certainties at which he aimed, and which he would have reached had he not been stopped by the intermediate continent which ought to bear his name. Had Heron, when he first announced and executed his revolving boiler, been able to point out that it was a method of producing force by an apparatus which might supply the demand for a more human labour—that all which remained was adaptation—and that skill in the use of this new kind of force would make it a substitute for the strength of men and beasts, there is no reason why we should not give him the title of the discoverer of the steam-engine, and the in-
ventor of the first step. Among the consequences of attempting to describe discoveries under too general terms, is this, that both things and persons are allowed to clash unnecessarily.
It is not always, to be sure, that this pears such a length as procuring for Dalton’s atomic theory the character of being a republication of the notions adopted by Epicurus from his predecessors; if it did there would be the less harm: there are many theories between which mischievous confusion is more easily perpetuated than those of the philosophers of Athens and of Manchester. The nomenclature of science is perplexed by phrases of non-precision—as that Newton discovered gravitation, instead of a true explanation of the heavenly motions by means of gravitation—yet the 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 confused. It must also be noticed that a mere opinion does not result of choice between one or other of which must have been taken, is confounded with the same opinion advanced and supported by reasons. Thus Philolaus and Aristarchus ascertained 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? This is a priority of publication to me, as often happened, two persons should discover the same thing about the same time, the one who first publishes is universally recognised as the discoverer. Of course, if a fraud can be shown, to be satisfactorily done, i.e. that the first publisher stole 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 trial of the case, the priority of publication.

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, 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 be more easily satisfied with a small per cent difference between the just and the fraudulent, than a small per cent of punishment for a crime of this magnitude.

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. Selves, at hazard, the name of a result, and of its first announce; no doubt will exist in the mind of any one, used to the history of science, that it is at least fifty to one the name of the real discoverer is thus given. But if it be that the discovery was made too late, and, for that reason, 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 made out, from internal evidence, that Archimedes must have known the principle of the lever and a difference of deference to the notions of his time prevented him from publishing, it would never do to let the formal claims of Leibniz 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 claiming of priority, and the claiming of the facts. The former demands true facts, the latter just appreciations of his merit. By a perversity of the human mind, Newton and Leibniz would lose fame to-morrow, more or less,—that is, more with some and less with other people, than if Archimedes had been left 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 proof. Priority is nothing, and the claim of the individual: the former demands true facts, the latter just appreciation of his merit. The same principle applies in this, that the earlier an invention or discovery is made the nearer are the methods and instruments, and the fewer the hints to which it is due. For example, D’Alembert re-invented a method of analysis [Pacioli in Opera, p. 192] in the year 1754, which he hand to the French Institute within a few weeks of each other, the pre-
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presumption must be rebuffed by any one who desires to prove plagiarism. But as the observation becomes greater, the presumption, for 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 some difficulty in the nature of the subject in which 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 counterfeit it perfectly originally. To detect this base metal is not always easy: to prove its baseness is next to impossible. But it mostly happens that really independent investigators carry their results to different lengths; one will go further in one part 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 discoverer 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 with talent, 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 driven into their country, and all whom they have driven out. Many 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: while those who are driven away do honour to the race, 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, preferred to go to the kingdom of France, resident there from 1787 till his death in 1813, was exempted from the expulsion of foreigners ordered by Robespierre, and received, during all governments from the old monarchy to the empire, every possible honour and aid,—is a greater credit to French institutions and feelings than if he had been born in their country. But as far as blood is concerned, he is almost wholly Italian, having been born, and established his first reputation, at Turin: it is said, we do not know on what authority, that his great grandfather was a Frenchman, which may entitle France to claim the eighth part of him. De Moivre, on the other hand, born of French parents and educated in France, was driven from his country by religious fanaticism, and none of his works were published either in France or in French. Whatever credit his talents may do to his race, he is but a foreigner in the institutions, as to which he never lived. Not that he received such encouragement here as would entitle us to say that the honour lost by France was wholly gained by England. While picking up a scanty livelihood, perhaps, by only walking, or writing, he could find time to read the Principia was by tearing it leaf by leaf, and carrying a leaf in his pocket to look at while walking from one pupil to another, or at any other chance interval.

There is much absurdity in the mode by which national processes in matters of discovery is tested. A few of the very first names are made the only subjects of comparison. There is some presumption, certainly, that the great names are best of many, and that the plants most abroad where the largest plants are found. But this presumption must not be urged when an attentive consideration will settle the question. *We take this opportunity to correct an insinuation against a statement made by Newton, which appeared in a letter to the editors of the Royal Society, as cited by Dr. Thomson and Sir David Brewster, the committee appointed to report on the dispute about the invention of fluxions consisted of Aristotle, Hill, Halley, Jones, and Machin, Burnet. This, we said, was very unjust, and brought in the names of different nationalities. We could thus suppose that the list in the Royal Society's own records was incorrect: nor that it could be supposed that Newton's name is inserted to discover an error. But in the life of De Moivre, written by 'Mr. Mary,' as he calls himself, but who must have known the vituperations of envy, of faction, of autobiography, and of the friend of De Moivre, we find it stated that the committee consisted of Aristotle, Hill, Halley, Jones, and Machin, Burnet. The life of De Moivre, written by the learned author of the life of David Hume, Roett (the principal Motteur), De Moivre, Aston, and Taylor (the learned editor of the Royal Society's Transactions) says that the Royal Society's statement is correct, and that the first five names were subsequently added. Newton was therefore justly incurring the consequences of his conduct, though the neglect of those who sought to have ascertained all the minutes which intervene between the first appointment of the committee and the report. That Newton has made his assertions of being the discoverer, and as such, is a subject of which he must have known the truth.*

without it. Archemedes was the greatest of the Greek mathematicians; but his fame is but little reflected in science of all the countries in which Greece had colonised. So far from it, that when in the sixteenth century, Maurolico lived and wrote, the following epigram was made upon him—

\[ \text{To gouge Zanella tint, Maurolico, se sit in uno Clara Syncrolo shea are on.} \]

The most difficult question of all is undoubtedly what degree of merit belongs to a discovery, and the settlement of the question where in the list it places its author. The public in general judges with utility; whereas it is notorious that many discoveries show more power of mind than others of much greater value to the world. The rule of utility is a good one for mankind in general; but it must be taken with modification by the historian of science. Who has most benefited his species, and who has shown himself most above all his species in intellect, are two different questions. The merit of the inventor, and his genius, are not comparable quantities. The former is determined by the study, the personal skill or inclemence which it was requisite to undergo, the patience and perseverance which must have been shown, and the goodness of the motive which appears to have attended it. The latter is the greater the less the pain and labour, and the wholly independent of moral considerations. A patient schoolboy who multiplies one number another with time and care, will have more merit than a wonderful youth who has appeared, and who can do it in their heads; but the first has far less mental power, in this one line, than the second. All these things are plain on the first statement; but they are far from receiving the same attention, and will so remain until the history of discovery is written without too much deference to popular reputation.

We may mention, as a thing to be guarded against, the disposition to depreciate a discovery because it is not something more than it pretends to be, which is frequently combined with a wish to judge of its merit by an arbitrary *a priori* standard of what it ought to have been. Sturm's theorem is a very pretty instance. Before it appeared, a purely theoretical and strictly certain method was eagerly sought after, and any such, however difficult, would have been held a great gain. The object is at last attained, but in a manner which is troublesome to use. To look at the way in which some writers now mention it, one would suppose they had entirely forgotten how many investigators of the first order had given up the subject without producing any method at all. INVESTITURE. [FREDA SWEERT, P. C.]

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 Computation, P. C. S.* is one of the best exercises in computation; and secondly, because of its meaning, and is 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 *involution,* as defined in the article cited, is the formation of the value of a rational and integral algebraical expression, such as \( (ax + b)^n \), by a succession of multiplications separated by additions, as in

\[ \{ (ax + b) (ax + b) + \} + \]
We first put down the coefficients as usual, not changing the order of the columns (which is only a matter of 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, 3, 4, 6 places. We then proceed with 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 unit-points). As soon as we have done the first 121-23, we go on in all that comes before the lines A, we learn as follows. Let 
\[ \frac{1}{2}x = 9z^2 - 3144x + 9000 \]
then, x being 100, \( \frac{1}{2}x, \frac{1}{2}z, \frac{1}{4}z^2, \frac{1}{4}x^2 \text{ and } \frac{1}{4}x^3 \) are severally 987176-301, 200971-609, 2669-850, 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 2 in 121-23), which, having one cipher, we mark off 0, 1, 2, 3 places in the several columns. Immediately before the lines B we learn that when \( x = 120, \frac{1}{2}x, \frac{1}{4}z, \text{ and } \frac{1}{4}x^2 \) are severally 150503481-181, 388046-169, and 3236-695. We then write down these results without any commas, and proceed with the second 1 in 121, from which we find that when \( x = 121 \), the functions are 15896563-209, 39456-867, and 3269-659. 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 121-23 work with, and applying Horner's process, we find, when \( x = 121.2 \), that \( \frac{1}{2}x, \frac{1}{4}z, \frac{1}{4}x^2, \text{ and } \frac{1}{4}x^3 \) are severally (remembering that all the annexed ciphers are so many additional decimal places) 15079257-2176, 395835-51060, and 3269-5260. Finally, we annex the ciphers with the 2 and we find that \( x = 121.2 \) gives 15087533-760954100, 396049-8064400, and 3269-096000.

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 farther 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 the second method, and is not 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 get additional 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 121-23 - 008, which will require us to calculate \( \frac{1}{2}x^2 \), and perhaps also \( \frac{1}{4}x^3 \).

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 \( x^2 \) or the value of 14796 \( x + 0 \) when \( x = 32316 \). We repeat the lines as before, but not than is necessary, and makes this process look very long.

\[
14796 \quad 0.0000(32316)
\]

\[
443898.0000
443898.0000
473472.0000
473472.0000
4779108.0000
4779108.0000
47805870.0000
47805870.0000
478147536
478147536

Required the square of 279-46, or the value of \( x^2 + 0x + 0 \), when \( x = 279-46 \).
To what is said in *Involution and Evolution*, P. C., we may add the following remarks:—1. When the last term is positive, and would 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 $a^2-11a+1=0$, the heads of the columns should be $-1, 0, 1,$ and $1,$ instead of $1, 0, -1,$ and $-1.$ Also, that if at any period of the process the divisor and dividend columns should become negative, the signs of all should be immediately changed.

2. In making the contractions, it will be advisable to make the figure which comes next after the separating line correct, to continue it, in fact, till the next contraction, and to use it to carry from, till it be not used in our main article (P. C.), but it is done in the instance in *Computation*, P. C. S., that in that instance, the following figures, seen one over the other in the last column but one, as follows $3, 5, -6, 9, 1,$ $-2, 3, 2,$ are figures cut off by the contraction, but made up from the second column to carry from into 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 continuation 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 $z^2+6z+9=0$, which has two roots, each equal to $\sqrt{3}$. 

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>2</th>
<th>1-7392</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>-2</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>-3</td>
<td>5</td>
<td>0</td>
<td>597</td>
<td>5041</td>
</tr>
<tr>
<td>-4</td>
<td>0</td>
<td>9</td>
<td>74800</td>
<td>9</td>
</tr>
<tr>
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<td>7</td>
<td>0</td>
<td>401653</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>0</td>
<td>114900</td>
<td>49232</td>
<td></td>
</tr>
<tr>
<td>-7</td>
<td>1</td>
<td>0</td>
<td>544900</td>
<td>52190</td>
</tr>
<tr>
<td>-8</td>
<td>0</td>
<td>117507</td>
<td>1290</td>
<td></td>
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<tr>
<td>-9</td>
<td>0</td>
<td>119357</td>
<td>1290</td>
<td></td>
</tr>
</tbody>
</table>

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 $7z^2-10z^3-14z+20z=0$, of which it is known that one root lies between 1 and 2. The ordinary process gives

<table>
<thead>
<tr>
<th>-7</th>
<th>10</th>
<th>14</th>
<th>20</th>
<th>1-41421356</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>17</td>
<td>5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-110</td>
<td>800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-110</td>
<td>748</td>
<td>157400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-138</td>
<td>4800</td>
<td>61608</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-166</td>
<td>453</td>
<td>3580</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1940</td>
<td>449000</td>
<td>1013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1947</td>
<td>371348</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-1954</td>
<td>292894</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-19610</td>
<td>283775</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-19638</td>
<td>284806</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>-19666</td>
<td>286407</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-19694</td>
<td>28440</td>
<td></td>
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</tbody>
</table>

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 8000, and the preceding column as much as $-1940$, 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 $pa-b$ 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 $p(p+1)b-c$ has not two positive roots. The three last columns are $-a, b,$ and $c,$ and may very easily happen that $-pa = b,$ nearly $c-pq,$ and $b-pa = b,$ nearly $c+q$; for $(b-pa)=c$ has two positive roots. Perfect certainty, in the absence of an easy algebraical criterion, may be obtained by trying every figure. In the instance before us, finding $1-41$ succeed, with a presumption of a larger root, we try 1-43, beginning with $-7$ and $1940, 8400, 8000$...

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:

<table>
<thead>
<tr>
<th>-7</th>
<th>1940</th>
<th>55600</th>
<th>-94800</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1968</td>
<td>-103408</td>
<td>-156726</td>
<td></td>
</tr>
<tr>
<td>-19636</td>
<td>-262864</td>
<td></td>
<td></td>
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</tbody>
</table>

and $26286400$ is not contain 10 times in $156726000$. All the signs being now negative, we may change them all. If we had tried 7 instead of 8, we should have had

<table>
<thead>
<tr>
<th>-7</th>
<th>196800</th>
<th>55600</th>
<th>-94800</th>
</tr>
</thead>
<tbody>
<tr>
<td>-196900</td>
<td>-83483</td>
<td>-396919</td>
<td></td>
</tr>
<tr>
<td>-191800</td>
<td>-222999</td>
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</tbody>
</table>

But now 29920000 is contained more than 10 times in 399619000, which shows that 7 is not high enough. If we try 9, we have

<table>
<thead>
<tr>
<th>-7</th>
<th>19800</th>
<th>55600</th>
<th>-94800</th>
</tr>
</thead>
<tbody>
<tr>
<td>-198000</td>
<td>-129547</td>
<td>1-39199</td>
<td></td>
</tr>
</tbody>
</table>

and a permanent difference of sign is established between the two last columns, whence 9 is too high. Proceed then with $1998800$ and $26286400$ ... for a root. The reader may watch the operation in the following equation:

$9a^2-66a+73=0$

the roots of which are $1-111$, $1-299$, and $1-238$...

Whatever common figures two roots of $a^2=0$ may have begun with, there must be a root of $\phi=0$ which begins with these figures. And whatever common figures three roots may begin with, there must be two roots of $\phi=0$, and one root of $\phi=0$ 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 $\phi a=0, \phi a=r, \phi a=0$, 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,

$9a^2-66a+73=0$

It will be seen in the following process that 2 is a root, with a presumption, by 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.

<table>
<thead>
<tr>
<th>-9</th>
<th>46</th>
<th>75</th>
<th>38</th>
<th>2-11111</th>
</tr>
</thead>
<tbody>
<tr>
<td>-12</td>
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<tr>
<td>-10</td>
<td>100</td>
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<tr>
<td>98</td>
<td>9775</td>
<td>19</td>
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<tr>
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<td>1079</td>
<td>10877</td>
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<td></td>
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<tr>
<td>1088</td>
<td>11087</td>
<td></td>
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</tbody>
</table>

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 Viet\ud322, resolution 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 (VIET\ud322, 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 equal to zero in the equation. This method of Viet\ud322 is in fact that which Horner’s process now makes so easily practicable. If there be the equation, and a part of the root, it uses $\phi a$, and $\phi (a+1)-\phi a$ as a divisor. The process is so cumbersome, that Viet\ud322 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 (Liber Tertius, P. C.) examples of it are given with the improvements of certain figures of the divisors as were wanted; and he ventured upon roots of three places. In the second edition of Oughtred's 'Clavis Mathematicae' (1667) Vieta's method is given without Harriot's improvements. It did not find itself among the first who used Vieta's method to any great extent was Briggs, in the calculation of the sines, &c., in the 'Trigonometria Britannica.' In the preface the method is applied to equations of the third and fifth degrees. As partially described for the seventh and higher degrees: with examples carried to fifteen and sixteen figures of the root. It is for the facilitation of these solutions that the Abacoa exxpresvis is given, which some have incautiously laid called it 'l'art de la superficie.'

Lagrange's method of transforming the root is based upon a continued fraction ('Theory of Equations,' P. C.) does not need notice here, because it belongs to another mode of expression. But it ought to be noticed that Horner's process very much abridges the labour of Lagrange's method, as much indeed as it does that of Vieta's exxpresvis, and for the same reason. Mr. Exley, of Bristol, in the 'Imperial Encyclopaedia,' article Arithmetic, improved (according to Horner himself) the common method of extracting the cube root, so as toprecede Horner in this particular case. We believe more than one method has been given for finding the successive labour of the ordinary extraction of the cube 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 Hutton's arithmetic. He gives the sixth, 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 instance to 'make a new claim to the invention. Mr. Horner was unfortunate in two points. First, he had not sufficient knowledge of antient 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 systematised. 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 \( \tan x = ax, \) or \( a^m = x, \) as to the other who wants nothing but a common algebraical equation. So far, then, it is more than Vieta's method simplified. But he is the same method as the inventor had proceeded from simple algebra to the more complicated cases, his merits would have been more rapidly appreciated. He did not well see that his mode of solution applies as well to the integral 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 hold even of the most convenient arithmetical process, we give his solution of the famous Newton's equation, \[ x^3 + 2x^2 + 2x - 7 = 0, \] which is 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 'ciphers, and proceeds exactly as follows:

As soon as Mr. Horner's paper had been published six months appeared 'A New Method of Solving Equations,' by Theophilus Holdred, London, 1820, (preface dated June 1st) 4to. This was taken from Horner; and a supplement is added, which gives Horner's method. Both are claimed as independent inventions, and Horner's name is not mentioned. Mr. Holdred asserts that, after having had his 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 to the conclusion that Mr. Holdred did not see Mr. Horner's paper.
to the conclusion that Mr. Holdred took his first method from Horner, and his second from Horner's.

Mr. Nicholson was the first to publish in various places, which is quite futile. We acquire Mr. Nicholson (a highly respectable man, eminent in the application of mathematics to the arts) of all unfair intention: and we must remind our readers of a point without the knowledge of which the various controv-

ersial writings on this subject will be full of confusion. Hardly any one knew of Viete's Exegesis, which there is little doubt that both Horner and Atkinson reinvented. In fact, so complet-

ed had this expectation dropped out of sight, that even Dr. Peacock, in his short account of Horner's method ('Report on Analysis to the British Association') does not allude to it. Accordingly, all the re-inventors of Viete's method speak of quick and easy for the solution of equations, and treat Horner's process as a constituent part of one of the new inventions. But a person acquainted with the history of the subject finds nothing new except Horner's own. Viete had the main system, Briggs had the Newtonian divisor, Wallis had the method of contraction, Briggs had a method of making one disvisor help the rest: Horner had the method which must finally be adopted.

Budan, as we shall see, had only a particular case of that method, and did not apply it to any mechanical process of numerical solution.

Mr. Nicholson claims Horner's identical process, and fairly refers to the very place in which he says it is to be found. But on looking there (see the article already cited in the 'Companion to the Almanac'), we find that he has been deceived by a distant resemblance, and that, though he has given a new and useful process for a particular purpose, neither the process nor the purpose is Horner's. At the same time it is just to Mr. Nicholson to say, that in his 'Elements of Algebra,' London, 1819,' 3mo, he made as near an approach to Horner's method as could well be done, and applied it in the case of equations of the second and third degrees. The success of columns is seen, each column helps the next, and each step in any one column helps the next step. But the great simplification of which the controversy consists (the non-figure method, is wanting: so that this process of Nicholson's is perhaps hardly more than Briggs was in possession of. Mr. Nicholson had received Mr. Holdred's method, whose name he improperly mentions in the preface. This method had he greatly improved; and it seems he wished that Holdred should publish his amended methods; but he asserts (in the preface to his work on Involution and Evolution) that the latter refused, alleging that his own credit would be dimin-
ished, unless he could pass them as his own.

Dr. Peacock had never seen Holdred's tract, and his result, derived from the assertions of Mr. Nicholson and from Horner's paper, is that Nicholson, by a combination of the methods of Holdred and Horner, reduced the method to its present practicable form. But any one who will solve \[ x^{2} - 2x = 5 \] in the above manner, will see that the process is different from that form. Nicholson was, we believe, the one who first clearly saw that the method, in its simplest organization, ap-

dies as well to the integer as to the fractional portion of a root. All Mr. Nicholson's simplifications, as given in his latest writings, consist in doing in the head some of the things which Horner put down on paper. The form we give carries this still further; and those who can do what we have recom-

mended all arithmeticians to practise in Computation, P.C.S. can follow us: but there is no invention in this.

Some have been disposed to give a good deal of the merit of this system to Budan; and his claim must be considered. Two editions of the 'Nouvelle Methode pour la Resolution des Equations numeriques,' Paris, 4to, were published in 1807 and 1822. The basis of M. Budan's operations is the simple case of Horner's process in which the root of an equa-

tion is diminished by unity. This is done exactly in the mode by which Horner afterwards proceeded. Thus to lessen the root of \[ x^{2} - 2x = 5 \] by unity, Budan proceeds thus:

\[
\begin{align*}
1 & + 0 & - 2 & - 5 \\
& & & & 1 & + 4 & - 1 \\
& & & & 1 & - 4 & + 0 \\
\end{align*}
\]

Answer \((x^{2} - 2x = 5) = 0\) by unity, Budan proceeds thus:

\[
\begin{align*}
1 & + 0 & - 2 & - 5 \\
& & & & 1 & + 4 & - 1 \\
& & & & 1 & - 4 & + 0 \\
\end{align*}
\]

Answer \((x^{2} - 2x = 5) = 0\) by unity, Budan proceeds thus:

\[
\begin{align*}
1 & + 0 & - 2 & - 5 \\
& & & & 1 & + 4 & - 1 \\
& & & & 1 & - 4 & + 0 \\
\end{align*}
\]

\(x = 2 + \frac{1}{2} + \frac{27}{16} + \frac{16929}{20} = 0.4561481364\)

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 singly enough the only example given is one in which \(n = 1\). Mr. Horner ('Leyburn's Repository,' page 38, of part ii., vol. v.) denies ever having seen Budan's work until 1818, after his method was finished. This in 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 thereof arising, even though it could be shown that subse-
quent 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 contempo-
raries on the road towards the complete method: conse-

quently, Budan must have, in one sense, the merit of having proposed a particular case of that which Horner afterwards used. 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 (p. 123) 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; on which time he mentioned to me that the author was engaged in something of the same kind.' 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 argued from the date of Mr. Nicholson's preface that 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 answer, 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 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 the members of the Institute had seen it. Lagrange, too, knew of Viete's Exegesis. But no one,
except the Bath schoolmaster, ever brought forward Budan's method of consideration of it, either 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 method of 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 it. In the first place we must give the author, whose name we have preserved, the credit of his genius, his rights over his own discovery. We refer to M. Holdred and Nicholson: though we do not believe the second was knowingly unfair. Mr. Atkinson, when he first saw the 'Mathematician's Magazine' (as some called this paper,) 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 systematic and regular method of approximation. It is a process which, at its outset, is not difficult; the Oxford and Cambridge elementary works do not yet recognise 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 Elements of Algebra, published in 1806.

In 1811, 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 $q_6$, $q_7$, $q_8$, $q_9$, etc., to calculate the value of $\phi(a-b)$, and of $\phi(a)$, respectively, to calculate $\phi(a+b)$; and so on. Fourier was an expert arithmetician, and in this very work he shows his power of suggesting new forms of arithmetical process; but he does not come near and does not like such an extension of the previous calculation of $\phi(a+b)$, which gives assistance to that of $\phi(a-b)$. The equation $x^3-2x=5$, 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 one of the College) done exceeding knowledge of years of age, carried Horner's process further still, their independent calculations giving, as the root to 52 figures:—

$$2.09465, 14815, 42226, 59148, 23965, 40579, 30296, 38575, 60105, 62863, 3$$

Mr. Nicholson gives, as the work of a young computer, the following solution of

$$4x^3+7x^2+6x^2+5x+3x+792$$

$$x = 2.05204, 21769, 76905, 36521, 40484, 12961, 20197, 34602, 75999, 54544, 17224, 14$$

We have left entirely out of sight all the irrelevant controversy relating to the method of finding the limits of the roots of such a process as these, when the roots are nearly equal or the same. The claim of Budan, Fourier, Horner, &c., are here mixed up in a manner which requires a sifting investigation. Very frequently the value of Horner's method is stated as depending upon points of this kind. When any of the doubtful cases arise, which we noticed at the beginning of this article, we find, for ourselves, that the ease with which repeated trials are made by Horner's process gives us more command of these questions than anything else; in the case of Fourier's theocrom (Sturm's Theorem, P. C.) is very easily brought to bear by means of it. But it must be admitted, that all methods which in any way include the Newtonian approximation, or any part of it, are much in my opinion equal, in having a better addition to the root already obtained than $-\phi(a)/\phi'(a)$. Let a better method come, and we have no doubt that Horner's process is more ready to make easy use of it than any other. A student who is very slow at finding out the true figures of common division, might with reasonable depreciate the rule of division altogether, as quarrel with Horner's method because there is now and then a difficulty in ascertaining when his work is correct. He might be more easily satisfied with the scholar applying the same process. The same difficulty must exist in every method, as matters now stand. In the meanwhile, we think the discoverer of the process, which is now beginning to take its proper place, should be received with the warmest and most respectful greeting. 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 his process.

INWOOD, the family name of three architects, father and two sons, who constructed many public and private buildings in London and elsewhere.

William INWOOD was born about the year 1771. His father, Daniel INWOOD, was half-fellow to Lord Mansfield, at Caen Wood, Highgate, near London. William INWOOD was brought up to the professions of architect and surveyor. He was employed as steward to Lord Colchester, was surveyor to a large number of persons, and several architects now living were instructed by him. He had two sons, one or other of whom was employed conjointly with himself in most of his larger works of architecture, and he was assisted generally in all his professional pursuits by both. He died March 16, 1843, aged about seventy-two. He was the author of 'Tables for the Purchasing of Estates, Freehold, Copyhold, or Leasehold,' a work held in repute by the Remuneration of Churches, Colleges, or other Corporate Bodies, for Terms of Years certain and for Lives, &c., London, 1811, 8vo.; it was written by Budan and Smart. It principally differs from previous works in its method of finding squares and quarters, as well as to decimals of a year; the former being intended for those who cannot read decimal fractions.

Henry INWOOD, 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 he not suffered so much as he did for many years from ill health, would have been really a 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 Erechtheum at Athens, Fragments of Athenian Architecture, &c., illustrated with Thirty-nine Plates.' The work, which consists of 162 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 'Of the Resources of Design in the Architecture of Greece and Other Countries, obtained by the Study of the Architects of those Countries from Nature,' 4to. London, 1834, with explanatory engravings. Two parts were published, but owing to ill health and his untimely death the work was never completed and the life of the author remains of antiquity, most of which are now in the British Museum.

CHARLES FREDERICK INWOOD, second son of William INWOOD, born November 28, 1798, besides assisting his father in his works, was the architect of the church of All Saints at Great Marlow, in Buckinghamshire, which was completed in 1825. He also built the St. Pancras Roman Catholic Church, in Southampton 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 beauties unique among the churches of the metropolis. The building was commenced July 1, 1819, was completed May 7, 1822, and cost 70,767l. 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 (ERECHTEIUM, P. C.); the tower is a faithful imitation from the building, and the Tower of the Winds, also at Athens, which is properly the Horologistium, or water-clock, of Andronicus Cyrrhestes. The measurements and drawings of those buildings were made by Henry Howard, the author, and he fixed the spot. The east end of the church supplies the place of the straight west wall of the Pantheon, or temple of Pandrosus, which adjoined the Erechtheum at the west end. The two covered...
buildings which project from each side of the east end, form ing a porch, the caryatids are adaptations from the south portico 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 porch. The portico on the upper west north portico had columns. There is one of the original caryatid figures in the Elgin Room of the British Museum. The sarcophagus beneath each roof indicates the purpose for which the projecting buildings were 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 tower. The windows are adaptations modelled in accordance with the form of those of the Sophilos temple; and the material is gray Sulphur 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 and the door to the entrance, to the entrance of the tower, 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, with the five windows, and the corbelled ornamental stone facings. 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 tower is built in brick and brick, and 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 top, and each window is surmounted by a weather-moulding. There are in 260 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 same tower. The deep stone battlements are supported by a wall of stone occupied by the old battlement. The interior arrangements and ventilation are excellent. There are 19 wards and about 250 beds.

William Inwood had the Regent Square Chapel, opened in 1826; the Camden Town Chapel, opened in 1824; and the London 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; &c. 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 a line drawn direct from the centre 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 United States. The capital is at a distance of 250,000 square miles, which is nearly four times the area of England, with the exception of Wales. Of the northern part of the territory a very large portion is covered with a vast area of forest, and high ground, called the Coterie des Prairies, which commences about 48° 30' N. lat., and terminates about 43° N. lat., extending in width more than fifty miles between 99° 30' and 100° 30' W. lat.; and the length of the huge mass, which is said to be to 10,000 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 Cotcau des Prairies is an extensive valley, in which the Red River runs northward to Lake Winnipeg, and the St. Peter's River southward to the Mississippi. West of Coterie 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 Coterie des Prairies. The number of small streams in this part of the country is extreme, but the upper valley of the river-valleys have been estimated to be more than 1000 feet above the level of the sea. The rest of the country between the Mississippi and the Missouri 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 occur near the rivers, especially contiguous to the Missouri and the Mississippi, but the flat lands of prairies is covered with bushwood. The south-east part of the territory, which is the only part in which the settlers are numerous, and where the lands have been sold by the federal government, is generally undulating, interspersed with timberlands and prairies, and abounding in springs and streams. This tract, which is very fertile, extends from the Des Moines River south to the Turtles River north, and westward from the Missouri fifty or sixty miles to the Indian boundary.

In Iowa there are numerous rivers, which rising in the elevated grounds of the northern parts of the territory, flow respectively eastward into the Mississippi, westward and southward into the Missouri, and northward into the British possessions. Those which flow into the Missouri are compared in length, breadth, and the number of the southwards of upwards of 400 miles, and falls into the Missouri where that river flows to the coast some distance below Grand Detour. Of the rivers which fall into the Mississippi, one of the largest is the Des Moines River, which is the an affluent of the Cedar River, the Wabashapinae River, the Great Macquenota 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 Lieutenant positions, through which it flows to Lake Winnipeg. In the most northern and north-eastern part of the territory, though the elevation above the sea is not much less than 1000 feet, it is a vast and a swampy, and the small lakes. There is a lead-nine 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, Bloomington, Iowa city, Dubuque, and Fort Madison. There is a newspaper published at Burlington. Iowa, the capital, is in 41° 26' N. lat. and 9° 42' W. longitude, from Washington.

Iowa was constituted a territory by an Act of Congress, dated June 13, 1838, and the government commenced July 4, 1838. It was then divided into sixteen counties, and the population, according to the census, was 22,869; in 1840 the population was 43,112; in 1844 it had become 81,920, 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 $2,500 dollars a year, and the secretary who receives $1,500 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 receive $1,800 dollars a year; the territory is divided into three judicial districts, in 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 erection of a building, 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
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 a certain point. The act was adopted, and the Territory, 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 8, 1845, which fixed the boundary of the Territory thus:—From the mouth of 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 line from the mouth of the Mississippi River, W. from Washington, D. C.; thence due south to 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-east 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 the United States 1,293,426 dollars, which is rather a dollar and a quarter per acre. There are still a great number of squatters.

The inhabitants of the Territory of Florida had applied for admission to the Union as a State; in January, 1835, 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. The extension of the new country and other particulars is given under United States of North America, P. C. S.

IRIS, a genus of plants the type of the natural order Iridacae. It has a tuberous partheni with a petaloid membranous limb, the segments of the sepals revolute, often bearded, three of the petals erect and converging; three stamens, concealed beneath the lobes of the style; the style 3- parted near the upper end with petaloid segments overarching the anthers and bearing a two-lipped transverse stigma below their ends; the capsule 3-seeded, bursting through the cells into three valved coriaceous, with numerous flat or round and drisy seeds.

I. versicolor, Blue Flag, has sword-shaped striated leaves sheathing at the base, a stem two or three feet high, round on one side and flat on the other, and bearing from two to six flowers. This plant is a native of swamps and wet meadows in the United States. The rootstock has a nauseous acid 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. pendul-accus, Yellow Flag, has sword-shaped leaves; the stem round; perianth bell-shaped, its inner segments narrower 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 seeds when roasted are sold 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, bright yellow, red, and rose and red spotted 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 rootstock has a subacid taste, and is employed as a dentifrice. It enters into the composition of Ruppin's tincture and tooth-powder, and other popular dentifrices. It was at one time used in medicinal preparations, and in the middle ages the rootstock acts as a purgative, and was also employed as an expectorant in diseases of the chest. When dried and turned into small balls it is used for issue-pees. According to Subilhac and Thory, it is found in Greece, on the coast of the Troad, and it is called Hiero of the Persians, 2, 673) and the Ipsi (aphae) of Theophrastus (Hist. Plant., 7, 12).

I. petalodiscus, Stinking Flag, has sword-shaped leaves, but in the stem and leaf the plant has a disagreeable odor, and is offensive to animals; it is used as a purgative and aperient as long as the stigmas. This plant is a native of Great Britain and other parts of Europe. It has a peculiar small worm, which some have compared to roast beef, but which is remarkably imperfect in its external and less pleasant associations. It is the Ipsi (aphae) of Theophrastus (Hist. Plant., 9, 8) and Ipsi of Dioscorides (4, 12).

I. tuberosa has tetragonal leaves, the segments of the perianth broad, the flowers without filaments, the capsule elongated, and the seeds eaten in Siberia. I. edulis is eaten by the Hottentots of Africa, where it is called Ooja. All these species are cultivated in gardens on account of handsome showy flowers.

(Franc. Synopsis Florae Classicae; Lindley, Flora Medica; Subilhac, Flora Graeca; Buchanan, Manual of British Botany; Burnett, Outlines of Botany.)

IRISH MOSS. [Cladaria Islandica, P. C. S.; Sea Wrack, C. P. C.]

IRON RATS AND SHIPS. [Ship-Building, P. C., p. 395.]

IRRADIATION denotes, properly, the emission of rays from a luminous object, but the word is generally used to signify an apparent enlargement of the disc of a celestial body when this enlargement is 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 fall upon 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 the rays in the pensile are made to converge 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 the earth, on which is a mass of land 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 from the different points; and if after rays in this manner convergent to a point; 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. Du Séjour, Lexella, and other astronomers, on calculating the diameters of these bodies by the length of the contacts of the sun and moon in eclipses of the former have, in order to produce an agreement between them, found it necessary to diminish the apparent semidiameters of the luminaries in each; and on account it is supposed, of the effects of irradiation.

It is a consequence of irradiation, that objects which are in reality of equal magnitudes appear frequently to differ in size five or six times; in the day of the full moon there is no irradiation; and hence the large errors of Tycho and Kepler now no longer correct the calculations of their contemporaries. Sir William Herschel remarked (Phil. Trans., 1783) that when a bright circle was viewed together with a dark one on a bright ground, the latter always appeared smaller than the former. The new calculation of the erroneous estimate of the magnitudes of the objects about the earth is, when seen against a bright ground, it appears
that the antients 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 susceptible to the effects of heat and ponds in the summer, appear to be placed on account that is 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 in the distance, as when concealed to be more remote than they really are.

ISATIS. [Walp, F. C.]

ISCYPOUS, a genus of fossil fishes included in Chimeridae.

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 Orogynaceae, and has 4-cleft calyx, 4 petals, 8 stamens, and a filiform style, with a clavate or cruciform stigma. There is one British species of this genus. *I. palustris* has a procumbent rooting glabrous stem, opposite ovate acute leaves, terminating in a petiole axillary sessile flowers, with the petals absent. It is found in pools and marshes in Europe, Siberia, and Persia, and in Sussex in England.

*I. alterefolia* has an erect branched stem, alternate leaves, rather hoary 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 'peco.

None of the species of this genus possess qualities which entitle them to cultivation except in botanical gardens. They may, however, be reared in a hot-bed, and then planted in an open garden in a sunny place.

(Dow, Gardener's Dictionary; Bebbington, British Botany.)

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 natural crystal is held in a horizontal line, and beneath it is placed one plate of tourmaline having its axes at right angles to 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, about each of two points as poles, forming together figures which may be considered as resembling lemniscates.

By the nature of the lemniscate, the rectangle contained by the two lines drawn from the poles to any point in the curve is constant; and the curves have received their designation from the Greek word *lemniscus* (a rope or cord), as the equivalent of such rectangle for that curve: when the light is viewed through plates of nitre of different thicknesses, the tint depends also on the thickness of the plate.

The rectangle is also the average area 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, when the curves be projected on a plane, the tint in each curve will depend on the product of the sine 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 in passing through the crystal.

ISOCRINITES, a genus of Crinoids (Goldfuss).

ISOLETUS, a genus of fossil Crustacea (Trilobites) from the Silurian strata, especially of North America (Greev).

ISSUE PEAS are round bodies employed for the purpose of maintaining irritation in a wound of the skin which is called an issue. [Lucas, F. C.] It is a matter of indifference of what substance these are composed so 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 laths before they are used as issue peas.

The unripe oranges, dried, are sold under the name of orangettes or Carsons oranges. The rootstock of the Iris florentina is also formed into peau and used for keeping up the discharge from issues.

(Johannes, Flora Medica; Christison, Dispensatory.)

IULUS, a genus established by Linnaeus for such Insecta as belong to the Order Myriapoda as well as the Order Chilognatha, the first division of the Order Myriapoda in the arrangements of Leach and Latreille. The Chilognatha have crustaceous and usually cylindrical bodies, formed of numerous unequal segments. They have very short feet, with two joints, the anterior being curved. They have a rounded head, furnished with two mandibles, which are either thick and robust or united with the labium and elongated. They have no palp. The antenna is two, very short, either slightly thickened towards their extremities, or filiform throughout, and composed usually of seven, more rarely (as in the genus Spharopus) of six joints. Their eyes are smooth and vary greatly in number. They are predatory animals moving 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 first part of the name is, of the Chilognatha, at the head of the Myriapoda, by Latreille and others, has been recently 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 important and accurate information concerning these curious animals.

The Chilognatha have usually been regarded by naturalists as the first order of the Myriapoda, partly in consequence of the more compact form of the head, and its similarity to that of the Ants and Spiders, and also of 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 some others, and very recently by Lucas. But a different and, as I believe, more correct view and arrangement...
ment have been followed by Professor Brindly, who regards the *Chilopoda* as the first, and the *Chilagnosta* as the second division of the class. Although I cannot entirely agree with Brindley in his division of the *Chilagnosta* into mastacating 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 taking liquid food, as *Spirastreptus*; I cannot deny that, in the *Chilagnosta*, a pointment on 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 habits of the species respectively. Thus, in the *Chilognatha* the greater part of the head is devoted to the mastacating and sucking habits; in the *Chilagnosta* the greater part of the head is devoted to the foot-jaws. In the *Chilopoda* the foot-jaws have the form of true mandibles, because the habits of the species require that compact form of jaw, which alone can be subservient, not to 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 Chilagnosta entirely subsist. In all other respects, both in their internal as well as in their external anatomy, and in their physiological and mode of growth, the *Chilagnosta* are decidedly inferior to the *Chilopoda*. They may be made to conduct us down to the Amelaidae from the vegetable-feeding features, as the *Chilopoda* do from the Arachnida to the same class.

The Chilagnostae: or Myriopoda are found in all parts of the world, certain genera, however, affecting certain geographical divisions. Thus the species of *Eremurus* are European; those of *Spirastreptus* and *Sphaeroenas* African and Eastern. The genus *Iulua*, in its most limited sense, includes European, Asiatic, and North American species. *Iulua terrstriss* is a familiar British example.

A synopsis of the genera of Chilagnosta will be found in the third part of the nineteenth volume of the "Linnean Transactions," appended to a valuable memoir on the Myriopa by Mr. Leidy. In a subsequent paper on these animals, published in the "Transactions and Proceedings of the Imperial Academy of St. Petersburg," Mr. Leidy says, a distinguished mathematician, born at Dundee, in 1765, 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 was a watchmaker, in that town, to which he became a clergyman of the church of Scotland. In that university the young man remained six years, during which time he was occupied with the study of mathematics, languages, and philosophy; but the first of those subjects, from a natural inclination to that branch of science, particularly engaged his attention: he was encouraged and helped 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 early indications of the eminence which, as a mathematician, he was afterwards to attain. The two following years were passed in further pursuit of his studies; and Mr. Ivory, in company with Mr. (afterwards Sir John) Leslie, who had been his fellow-student at St. Andrew's, to the university of Edinburgh, where he spent one year in completing the course of studies required for admission to the office of minister in the Scottish church.

It is not known what circumstances prevented Mr. Ivory from carrying out the intentions of his father in this respect; but it appears that about that time he was appointed as an assistant teacher in an academy then recently established in Dundee, and he continued to fulfil the duties of that post during three years. At the end of that time he engaged upon a project of establishing a school in Doughterton in Forfarshire, of 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 unconnected with 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. There have been at this time, that, though residing in a retired district, he, with the aid of the English mathematicians, together with those of the illustrious foreigners whose works were in the public libraries of Scotland and in the same kind at other places. He was thoroughly acquainted with, the later productions of the mathematical sciences. It is scarcely to be expected that a factory carried on under the supervision of a man of greater part of whose time was probably spent in researches which require nearly a total abstraction of the mind from the ordinary concerns of life, should have 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 founded. 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 appointments so well as to obtain the respect of his superiors; his attention to the students who were placed under him was unremitting; and it should be remarked that, however irksome it might have been to a man of high attainments in science to compose the base materials of his work, the compilation of a translation of Mr. Ivory always evinced the utmost readiness to assist, by the most appropriate and familiar illustrations, in smoothing the path of science to the pupil. An edition of Eudox's "Elements," which is known to have been his work, though his name does 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 solids, must have great advantage in elucidating the general ideas of learners in experience in acquiring a knowledge of those parts of elementary mathematics. In the beginning of the year 1819 Mr. Ivory, feeling his health declining 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 served before his retirement from Sandhurst, Mr. Ivory devoted himself wholly to scientific researches, and the results of his labours have been printed chiefly in the columns of the "Philosophical Transactions." In 1831, in consideration of the great merit 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, with the Duchess of Kent, made an Order of Knighthood, gave him an annual pension of 500L., 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 privacy in or near London till the time of his death, which happened September 21st, 1844, 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, "A new Method of resolving Cubic Equations, all of them radical results, and a mathematical solution of the problem;" all of them evinced great analytical skill, as well as originality of thought. He contributed fifteen papers to the "Transactions of the Royal Society of Edinburgh," nearly all of which related to mathematical and scientific researches, and mathematical investigations of the most refined nature. The first, which is entitled "On the Attractions of Homogeneous Ellipsoids," is in the volume for 1809, and contains investigations of the principal problems of astronomy, and in several instances within and on their exterior: the former case presents few difficulties; but the process used by Laplace for the solution of the other was very complex, and Mr. Ivory had the merit of reducing it to simpler form. A given point being on the surface of an ellipsoid, he hus-
glided another ellipsoid having the same centre and the same loci as the first to pass through the point; then taking, on the surface of the interior ellipsoid, a point so situated that the co-ordinates of the two points are in the ratio of the semiaxes to which they are parallel, he showed that the attraction in the direction of each axis is that of the two ellipsoids exercises upon a point on the surface of the other, is to the attraction of the latter body on the corresponding point at the surface of the first, as the product of the two other axes of the first ellipsoid is to the product of the two other axes of the second.

A direct investigation of this case has since been given by M. Poisson.

In the volumes for 1812 and 1822 there are three papers on the Attractions of Spheroids, in which Mr. Ivory substituted a refined analytical process for the indirect method of Laplace: the papers contain also some observations on the method employed by that great geometer in computing the attractions of spheroids of any form differing but little from spheres. The analytical skill shown by Mr. Ivory in these papers was frankly acknowledged by Laplace himself in a conversation which, in 1826, he had with Sir Humphry Davy.

The Transactions for 1814 contain an investigation, by Ivory, relating to the orbits of comets, on the supposition that these orbits are parabolical: the paper is entitled 'A New Method of deducing the first Approximation to the Orbit of a Comet from three Geocentric Observations.' And the volumes for 1823 and 1828 contain his investigations relating to Astronomical Refractions: in the first of these the temperature of the air is supposed to decrease uniformly with a uniform increase of height; and in the other the expressions are rendered general for all laws of temperature. The volumes for 1824, 1821, 1824, and 1839 contain, each, a paper on the equilibrium of fluid bodies; and in the volume for 1828 Mr. Ivory demonstrated that a homogeneous ellipsoid with three unequal axes may be in equilibrium when revolving about one of the axes: he also examined in detail the limitations of the proportions of the axes. The subject of planetary perturbations is treated by him in two papers which are contained in the volumes for 1832 and 1833; in the first he has simplified the theory of the variations of the elements, and in the other he has given some facilities for developing the eccentricities and inclinations. He has given in the 'Transactions' only one paper which is purely mathematical, and this is contained in the volume for 1831; it is entitled, 'On the Theory of Elliptic Transcendents.'

Mr. Ivory contributed several papers to the 'Philosophical Magazine': in the number of that work for August, 1821, he describes the method of finding the latitude of a ship by two observations of the sun's altitude, with the time elapsed between them; and in the volumes for 1825 and 1827 are his investigations relating to sound and heat. Several valuable communications from his pen are contained in Maureva's 'Scriptores Logarithmici'; in Leybourn's 'Mathematical Repository'; and in the Supplement to the sixth edition of the 'Encyclopedia Britannica.'

In estimating the merits of Mr. Ivory as a mathematician, it must be borne in mind that his researches were conducted by a most refined analysis at the time when even the notation of the differential calculus was not familiar to the English mathematicians; and that, when he wrote the papers relating to the attraction of spheroids, the volume of the 'Mémoires du Céléste,' in which that subject is treated, had probably not been read by anyone in this country except himself.

In 1815 Mr. Ivory was elected a fellow of the Royal Society of London: he was also an honorary fellow of the Royal Society of Edinburgh; an honorary member of the Royal Irish Academy, and of the Cambridge Philosophical Society; a corresponding member of the Institute of France, of the Royal Academy of Sciences of Berlin, and of the Royal Society of Göttingen. He received, in 1814, the Copley medal for his mathematical communications to the Royal Society; in 1826 one of the royal medals was awarded to him for his paper on Astronomical Refractions, published in 1823; and in 1839 he received another royal medal for his Theory of Astronomical Refractions, which was published in 1838.

(From the Marquis of Northampton's Address to the Royal Society, November 17, 1842.)

IVY. [Hedera, P. C.]

IZALCO is the name of a village in the State of San Salvador in Central America, and remarkable for a volcano situated about three miles from the village, and between eight and nine from the town of Zemeneate. This volcano is of recent origin. It is stated that it was formed about sixty years ago, and it is to be regretted that no particular account has hitherto been published of such a remarkable event. It broke out on the top of a hill of moderate elevation, which however since that event has been increased in size by the addition of lava, scoria, ashes, and other volcanic matter, and at present it may be called a considerable mountain. It is one of the few volcanos which are in uninterrupted activity, like the Stromboli of the Lipari Islands. The eruptions are almost continual, and whenever they slacken the country in its vicinity is subject to almost continual earthquakes. Sometimes the activity of the volcano is increased, and then large quantities of lava inundate the country at its base, the greater part of which has thus been changed into a stony waste.

(Thompson, Visit to Guatemala; Hackett, Central America; Montgomery, Narrative of a Journey to Guatemala.)

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JACARANDA of commerce is said by Prince Maximilian to be the timber of a Brazilian Mimosa.

(Burnett, Outlines of Botany)

JACKSON, JOHN, R.A., was born in 1778 at Lustingham, in Yorkshire, where his father carried on the business of a flour and meal dealer. He was brought up to the same business. He however hated his occupation; he had seen the collection of Lord Mulgrave, and the pictures at Castle Howard, and he had a strong inclination to become a painter. An attempt which he made without a patron by painting a portrait by Reynolds was shown by his schoolmaster to Lord Mulgrave, who receiving it in and others, notwithstanding their eminences, some talent, supplied Jackson with proper materials, and encouraged him to go on. Lord Mulgrave 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 comparati

sombre but well-planned portraits, and in his portraits of the moderns and of the English nobility, they had the delicacy 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 Romans required the other three months to copy; Passavan

...one of the three most remarkable portraits in the world.

Jackson exhibited in all, at the Royal Academy, between the years 1804 and 1830, one hundred and forty-five pictures; but his best works are the portraits of Mr. and Mrs. Lincoln, which he was sometimes paid for, and also for one of his fellow-academicians, but that of Flaxman, is in all respects the best; Allan Cunningham truly observes of this picture, that there is a 'sombre grandeur about it which answers one; it is certainly one of the finest portraits in the world.'

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In November, 1812, the next year he greatly distinguished himself by a campaign against the Creeks. 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 warranted 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 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 war was not terminated by the Treaty of 1814, but the Indians 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. After the conclusion of the hostilities, 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 repulse of the British in the battle of New Orleans, January 8th, 1815. The next military command which he held, was that of Andrew, his 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 finished his school education, he was sent to the Waxhaw district of South Carolina. After completing his theological studies for some years. When the war of independence, however, made all Americans soldiers, the young Jackson did not hold back. Andrew is recorded to have fought, along with his next eldest brother, Robert, under Sunbury 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 Spence McCay, Esq., an eminent advocate 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 battle of the seven - days campaign in 1781, when he, 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 "virile" of the republican territory were still infused 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 in his first campaign with these natural rivals of his race, that he was honoured among them with the titles, or descriptive appellations, of "Starb Knife and Pointed Arrow." 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 Cumberland river, he resided there in retirement till the breakin...
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the war against the Seminole Indians of Florida in 1818, for
the details of which the reader may refer to Mr. 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
proceedings in this, for which he obtained a tremendous
triumph, consisted of 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
carrying on operations, conduct of his government marked the
disapproval in the most emphatic manner, by the immediate
restoration of the places thus unwarrantably seized; but his
most extraordinary act was the execution of the two English-
men Arbutnot and Ambrister. Alexander Arbutnot 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 neighbouring 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
Indian nation had thereby passed over the two hundred and
twelve miles beyond the pale of the ordinary law of nations. Arbutno-
t and Ambrister were both, after a few days' confinement, tried
at St. Mark's by court martial; when Arbutnot was sen-
tenced to death, but, under the direction of the judge, he
further confided; but General Jackson annulled the latter
sentence, and Arbutnot 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
extraordinary proceeding, and one which would have appeared
unsuitable to the charge upon which the two Englishmen were tried was only
the very vague one of 'insecting the Indians to war'; in
circumstances it was certainly a startling exercise of military
power. The government, under the popular mayors 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 Arbutnot 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,
ot on the ground of their having united their forces with savages, but on that of their having been the
subjects of a power with which the United States were at
peace, on the ground, in short, that their actions were in utter
dissension of that place against the army of the Convention; his
second son, then a youth of fifteen, fought by his side. Being
bounced from the reduction of Lyon, they were both com-
pelled to fly, and they then joined the army of the Rhine.
His son was killed in it, and he was left without a friend
who would have been unable to support him in all this, for
how could he return to Lyon, where he had found his wife, whom he had been so
able to inform of his flight, earning her bread by plaiting straw,
in which humble occupation he was compelled by poverty to
exist. Lyon and his son attended tologgedIn repudiation of
the United States, and their artisans returned from Switzerland, Germany, and
England, where they had taken refuge. Under these circumstances,
Jacquard 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.,
p. 178. He had conceived the idea of such an appa-
ratus as early as 1790, and it was so successfully, though but
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
gold medal. In the following year he obtains 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
Carnot and several of the statesmen who were as-
sembled at that city in 1802 to arrange the affairs of the
Chalaine republic.
About this time the attention of Jacquard appears
were have been directed, by the accidental perusal of a paragraph from
an English newspaper, stating that a new society in this country for the invention of such an apparatus,
the construction of a machine for weaving nets for fishing
and maritime purposes. From the account given by Dr. Bowring, who had written
his autobiography for himself, before a Select Committee of the House of Commons
on the silk trade, in 1882, and which is made the subject of

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article in No. 56 of the 'Penny Magazine,' published in 1833, this would appear to have been Jacquard's first mechanical invention. It is more correctly accounted for in his 'Supplement' 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 by one of those ingenuity which his friends with some contrivance, he threw it aside. His machine-made net, however, 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 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, Jacquard was introduced to Louis Bonaparte, who, in the latter, 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. Jacquard, not disconcerted at such a reception, explained the action of his machinery with simplicity, and convinced the incredulous minister that the supposed 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 Metiers, 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 improvements for Vaucanson's loom, and with this new mechanism, improvements have been stated to be the origin of the Jacquard machine. According to the French authority above referred to, however, this improvement upon Vaucanson's loom may have been combined with his greater mechanism; that is to say, a very complex, its application limited to very small patterns, its action slow, and its cost very great, it is considered to belong rather to the class of curious than useful machines.

In 1804 Jacquard 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 protected by the firm of the illustrious Jacquard brothers in that city. Through his assistance, a commission of manufacturers was appointed to report upon the first-named invention, and eventually 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 presented him with the prize medal founded by the consul Lebrun. For some years Jacquard had to struggle against much opposition and prejudice on the part of the Lyonnais weavers, who conspired to discourage the use of his machinery, willing to spoil their work to bring it into discredit, and, through the Conseil des Prud'hommes, to which he was appointed, to watch over the commercial interests of the city, had it publicly broken up and sold as old materials. Even his personal safety was at times endangered. At length, however, under the influence of foreign appetites, the value of his inventions was acknowledged, and it was brought very extensively into use, not only in France, but in Switzerland, Germany, Italy, America, and, according to the 'Biographie Universelle,' "it has been introduced 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 England; but he preferred remaining at Lyon, where he continued 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 retirement, 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 1849 a public statute was raised to his memory. His 'Elcoge Historique' has been published by M. de Fertis.

The name of Jacquard, observe the writers of his memoir in the 'Biographie Universelle,' 'has become, so to speak, a term in the dictionary of old and new words, and a synonym of the inventors of the Vaucansom, who, like him, was engaged at Lyon in the improvement of weaving machinery. Jacquard has invented a simple and cheap machine, coming with a history of its introduction, as some learned the humble weaving art, which forms a memorable epoch—a new era—in the textile art.' By its agency the richest and most complex designs are produced with facility at the most moderate price; and, so far from an impediment, as some have stated on its first introduction, it has, according to the writers just quoted, increased the number of workmen in the manufacture in which it is used.

JALNA (Jalnapoor), a town of Hindustan, capital of the district of Jalna, is included in the province of Agra. The district of Jalna is comprised chiefly of two large valleys, one of which is watered by the Pouna and the other by the Jalna. Jalnapoor is a fortified town of considerable size. It was taken from the Maharattas by Colonel Stephens in November, 1803, in the course of the military operations which immediately preceded the battle of Assaye, and was afterwards ceded to the Nizam.

JAMESONE, or JAMESONE, called by Walpole the Vandyck of Scotland, was the son of Andrew Jamesone, an architect, and was born at Aberdeen in 1686. Jamesone and Vandyck were about 1618 fellow-pupils of Rubens at Antwerp. When Charles I. visited Edinburgh in 1616, he set to Jamesone, and presented him with a diamond ring from his own finger. He was probably in Italy, for his portrait is in the painter's portrait gallery at Florence; he travelled in company with Sir Colin Campbell of Glenorchy. Many of the conditions of his life are given by R. Reilly, 'Memoirs of Sir Colin Campbell,' but the greatest collection is at Taymouth, the seat of the Earl of Breadalbane. Sir Colin Campbell, the earl's ancestor, was Jamesone's first and chief patron. In a manuscript containing several portraits painted by Jamesone for Sir Colin, with reference to the history of the family, there is mention of several Jamesone's pictures also in the two colleges of Aberdeen. There is a portrait of Jamesone 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 being granted that privilege by Charles I. when he sat to him.

Though the pupil of Rubens and the companion of Vandyck, Jamesone's works have neither the finish 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 of a very different school from that of Rubens. It is called, says Walpole, 'a light rate.' There are several of Jamesone's pictures also in the two colleges of Aberdeen. There is a portrait of Jamesone 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 being granted that privilege by Charles I. when he sat to him.

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JAMESON, JOHN, D.D., is best known as the author of the Scottish Dictionary, but he published many other literary works, and for many years held a position in the metropolitan and provincial press. He left, also, in Edinburgh, a manuscript entitled 'Recollections of my Past Life,' a collection of his writings. He brought to the world a number of other works of the same kind, and among the most noticeable of these was the 'Memoir of the Life of the Younger Mr. Bruce,' which was published in 1798.

Forfarshire, 1798, Jan.

Minstrelsy in its session as a literary work, was brought into existence by the Rev. Robert Bruce of Garston, a young clergyman, who was ordained to the ministry of the Church in Forfarshire. He was also a friend and supporter of the Seceder movement, and was associated with Jameson in the publication of the Scottish Dictionary.

For the last quarter of a century, his time was devoted to the study of literature, and in addition to the works already mentioned, he published a number of other works, among them a 'History of the Seceders,' in two volumes, and a 'History of the Scottish Church.'

Jameson was a man of great learning and ability, and his works were widely read and admired. He was a man of wide knowledge, and was well acquainted with the literature of the world.

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Sea, lying between 70° 49' and 71° 19' N. lat., and between 7° 20' and 8° 44' 20" W. long. It extends from south-west to north-east, 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 mountain called Beerenberg. By Beerenberg, a peak rising to 6870 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 amount to elevations of between 1500 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 points.

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 there are three very singular glaciers: they occupy recesses in the cliff where it is more than 1000 feet high, and nearly perpendicular. They are very rough on the surface, and a greenish grey colour. They present the appearance of immense casuets suddenly arrested in their progress and congealed by the power of an intense frost. Like cascades, their prominent greenish colour is answered by the white matchless patches resembling foam, which, deeply contrasted with the jet-black points of the most prominent rocks peeping through their surfaces.

The coast has several roadsheets with good anchorage in five or six bays of water, black sand, and also shingled shore; 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 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 Beerenberg. The northern island is generally surrounded by ice in 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 auk, kittiwakes, and terns. Several estaceous animals abound, principally of the species Baluma 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 Vos, who, to abate much fire on account of the great number of whales, which, however, afterwards retreated to other parts of the Arctic Sea. In this time (1613-1614) seven Dutch seamen wintered here, probably for the purpose of engaging in trapping a bear and sealing. They prepared a regular journal. But on the arrival of the Dutch fleet in the following June all were found dead in their huts. From the journal, however, it appeared that they had not been killed by the whale, but by their scarcity of food and want of fresh provisions. Their journal terminated on the 31st of April.

(J.A.V., An Atlas of the Arctic Regions.)

JARDYN, KAREL DE, one of the best of the Dutch landscapists, 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 Bokkehaert (goat-beard). He died at Venice in 1678, aged about forty. There are many spirited etchings by his hand.

(Houbraken, Groote Schouburg, &c.; Bartsch, Peintres-Graveurs.)

JASIONE, a genus of plants belonging to the natural order Capparidaceae. It has a 4-leaved rotate calyx, anthers cohering at the base, a hairy trifid style, 2-celled capsule opening by a large and somewhat valvular pore at the base. There is but one British species of this genus.

J. montana has a simple root, bluntish oblong wavy leaves, and yellow flowers. The stamens are from six inches to two feet long, pliöse, 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.

(Rabbing, Manuel of British Botany.)

LAVOLPUS PRISCUS, a Roman jurist, from whom there are a few curiosities in the Digest. His period is not certain. He is said to have been a successor of Caeasus Sabinus, and he succeeded to the Sabini; and some writers place him in the time of Nerva and Hadrian. He was the master of Sulpicius Julianus. It may be supposed he lived between 160 and 200 A.D. (Zonar, 40, tit. 5, 6), that Javolpus sometime held the offices of governor of Syria and Africa. He is probably the Javolpus Praecis mentioned by the younger Flinn (Ep. vi. 15), who stopped by a timely answer Sulpicius Julianus from inflicting a sentence on him. Javolpus is mentioned by Capitolinus in his Life of Antoninus Pius as one of the jurists who were the advisers of the emperor. But this would extend his life beyond probable bounds. He was also the master of Minorus, who was the master of the Edicen Perpetuum under Hadrian, could not have been one of the advisers of Antoninus Pius. According to the Florentine Index, Javolpus wrote fifteen books on Cassio, that is, Cassius Longinus, fourteen books on Epistole, and five books on Plautius. He was also the author of an Epitome of the Libri Posteriorum of Laberio; and made notes on them (Ep. 40, tit. 12, x. 42).

HENKINSON, ANTHONY, or AINVIA, P. C. S.]

JEREMIE, SIR JOHN, was born in Guernsey, August 19, 1725, and was the eldest son of the late John Jeremie, a distinguished advocate of the Royal Court of that island. At his birth, an extraordinary prodigy, for, after 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 different 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 to plead causes in the Privy Council, where his talents and eloquence found a larger stage for their action, and brought him before the notice of government.

In October, 1834, he was appointed to the office of Chief Justice of S. Lucia, in the West Indies. 'At the time the offer 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 opposed 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 of his official duties, he devoted himself to the abolition of slavery, and in this capacity, he hoped that he was not only doing a good work of charity, but was contributing to the abolition of the system.

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 favour of its abolition, and prove that his subsequent devotedness 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 1825 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, produced a rapid but lasting change in his opinions. In proportion 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 slaves. His views on this important subject are fully put forth in his 'Four Essays on Colonial Slavery,' which he published on his return to England in 1831; in them he describes the general features of the slave communities, and the beneficial effect of the ameliorations already adopted, and he proceeds to show what he believes to be the only future system. The principle by which he was actuated in publishing these essays will be seen from the following extract. 'Such then,' he observes, 'is the unanimous and uniformly formed the West Indian communities; nor can they complain that they are anonymously misgained, that they are
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 Captain-general of Sierra Leone, in the West Indies, and he has repeatedly from the judgement-seat in the sternness of duty, with the still stern serenity before him. They are now published, neither vindictively nor in anger, but because, having availed every other method, he has acquired a personal conviction that publicity alone can lead to a thorough reformation.

In 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 his 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 work imposed. It was ever so as 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 something very 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 been recommended to the political committee to the legal system of democracy, 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 shore was cut off to the admiral, who 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 he published in vindication of his conduct. It is but necessary to mention that the governor thought it advisable, for the security of the public peace, to order him to return to England, believing he had previously declined to do so, except a written assurance 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, affecting his own striking language, and character. 'Within three years,' to use his own words, 'he had travelled fifty thousand miles, encountered the Asimain on shore and the pirate at sea; for ten years had it been his fate to face, in the service of the Mauritius, the storm and sunshine, and whether from the ocean, from climate, or from the hand of man.'

In the year 1836, he was appointed to the office of puisne justice 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 plate of plate was presented 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 and natural public estimation.'

His residence during four years at Ceylon was the only tranquil period of his eventful life. Early in the year 1840, he published a 'Letter on Negro Emancipation, and African Civilisation,' addressed to Sir T. F. Buxton. In it he describes the present, and shows what he considers will be the future effects of emancipation in the colonies, and gives a short outline of the progress which has been in the process of development. Mr. Jeremie says, 'we must look for the regeneration of Africa. To a reduct of the west upon the east, in moderate numbers, and managed with caution, must we look for the civilisation of the continent.'

It was to carry into effect the measures which had been
JOHN, KING OF SWEDEN. [CHARLES XIV.]

JOHNSON, DR. ARTHUR, the fifth son of an ancient family possessing estates in Aberdeenshire, was born in that county in 1687. At an early age he went abroad for medical education: and the degree of Doctor in Medicine was conferred on him at Padua in 1710. He traveled 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 1736, and was soon after wards appointed physician to Charles 1, probably through the influence of Land. After this appointment he must have resided chiefly in the neighbourhood of the court. In 1741 he died at Oxford, while on a visit to a daughter married there. Johnson's name is preserved in the memory of scholars by his Latin verses. He was the most extensive contributor, and is not unusually called the editor, of Sir John Scott's collection of Latin poems, the 'Dellitae Poetarum Scoitarum hujus Evi Illustrium,' Amsterdam, 1607, 2 vols. 12mo.; and besides several other volumes of compositions in Latin verse, he was bold enough to measure lines with Buchanan in a version of the Psalms, 'Paraphrases Poeticae (Scottis amicis abac. Mus.,' Edinburgh, 1667, 2 vols. 8vo. This ambitious attempt led, many years afterwards, to a protracted controversy on the merits of the rival versions. The history of the dispute is related, and Johnson's views of the subject are fully exposed in Dr. Moxon's 'Lives of Scottish Writers,' 1839, 3 vols. 8vo. It is enough here to say, that Johnson's high rank among modern writers of Latin poetry is universally admitted: and that, although in Scotland his poems have usually been estimated much below Buchanan's, the justice of this sentence has been questioned by critics of authority, of whom Mr. Halkam is one.

JOHNY (French, Mémorial) is the art of joining in the making of buildings, for making articles of furniture, and for numerous purposes requiring greater neatness of workmanship than the operations of the carpenter. [Carpenter, F. C., p. 392.] As carpentry is the practice of making, erecting, and working in wood, and a joiner is a person versed in this art, so the term 'joinery' is applied to the use of joints in the frames of buildings, to the making of articles of furniture, and to the construction of various types of objects in wood. The term 'joinery' is used to describe the work of a joiner, who is a person who works in wood, and who is usually employed in the construction of buildings, for making articles of furniture, and for numerous purposes requiring greater neatness of workmanship than the operations of the carpenter.

JOHNSON, Dr. Arthur. Life of. See life of John, King of Sweden.)

JOHNSTON, JOANNE. Munich, 1680. The account of the JODE, printed in Munich, 1680, was the first edition of the Psalms, and was issued in a large folio, with a dedication to the Elect of his own paper. The elder, the son of Gerard de Jode, also an engraver, was born in 1570. He was the pupil of Goltius, and worked 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 of the Last Judgment, by Cranach, and the two St. John's, making altogether about thirteen square feet, each four way: it is one of the largest prints in existence.

The younger de Jode, or Petrus de Jode, Junior, as he signed half of his prints, was born Antwerp in 1606, and was instructed in engraving by his father, whom he soon surpassed in execution, especially in the nude, and equalled in correctness of drawing. He worked with his father in Paris. His works after Vanderlynck, his best works, among them are his own, and those of Jordaens, Pouchet, Suellina, De Coster, and others, printers of Antwerp. He executed also some good prints after Rubens. The date of his death is not known.

ARNOLE DE JODE was the son of the younger Pieter, and was born at Antwerp about 1636. He is said to have been in London in 1687, and then to have engraved a print after the picture by Correggio, which belonged to Charles 1., and is now in the National Gallery. Scarcely anything is known of him personally: as an engraver he was inferior to his father and grandfather.

[Manuscript du Roy des Géants; Hubert, Manuel des Amateurs, &c.]

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practice the French joiners are very inferior to our own.

Their work, he says, 'is rough, slovenly, and often clumsy, and the look is that of a dirt unskilful hand.' 

On the other hand, the officers of the London Society, in a recent report, speak of the work of the Parisian colleague as 'neatness, 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, 'which exists between the manufactory and the forest, leads us to think that their theoretical knowledge is confined to architects, engineers, &c., instead of being diffused among workmen, as it is in this country.'

In the second place, is of primary importance to know the peculiar properties of the material that is used. This subject is briefly noticed under Carpenter, P. C. S., p. 292, and some information bearing upon it is given in Experiments, P. C., p. 120, is an explanation, illustrated by sectional diagrams, of the manner in which woody matter is formed, and of the arrangement of the component parts of the trunk of a tree.

Tredgold gives much information relative to various kinds of wood in his 'Elementary Principles of Carpenter,' and, in his treatise on joinery in the 'Encyclopædia 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 T. A. Knight, Esq., and communicated by him to the Royal Society in 1801 and 1817; and they appear to be opposed to some generally received opinions of the kind of timber best suited to the subject, printed in the ninety-first volume of the 'Philosophical Transactions' (p. 344, &c.). Mr. Knight observes, 'that there is in every kind of wood some workmen call its grain, consisting of the inner and more shrinkable portion of the wood, itself and its pith, &c.' The former, he explains, consists of those concentric circles which mark the annual increase of the tree; and the latter is composed of very thin laminae, diverging in very irregular veins from the medullary line, the parts being so near, that close adhesion to each other at any time, and less during the spring and summer than in the autumn and winter, whereby the greater brittleness of wood in the former season. His observations on this property of English oak, but they are, he says, more or less applicable to every other kind of wood, the wood of exogenous plants only, of course, being included in this remark.

The truth of his observations is illustrated by the fact that in drying whole trunks it is impossible to prevent the wood from splitting more or less, the cracks being in all cases directed towards the centre, thus indicating that the wood shrinks in a greater ratio in the direction of the circumference of the trunk than in the direction of its diameter, and that the radiating or diverging laminae of what Mr. Knight styles the true or silver grain will readily separate from each other, whereas the wood of the true trunk, as Mr. Knight observes, 'is usual to cut it as much as possible, into what are called quarter-boards, which are so named because the tree is first cut into quarters. In a perfect board of this kind, the latter will consist in part of the outer circle on which the tree most readily divides when cloven; in this case the lamina of the silver grain lie parallel with the surface of the board, and a board thus cut, when properly laid in the floor, is rarely or never seen to devote from its true horizontal position.'

An American machine for cutting up trunks so that all the boards produced may possess this quality is noticed under Saw-Mill, P. C., p. 481. 'If, on the contrary, to resume Mr. Knight's observations, one be sawed across the silver grain, it will, during many years, be incapable of bearing changes of temperature and of moisture without becoming warped; nor will the strength of numerous nails be sufficient entirely to prevent the inconvenience therein arising. This surface of a board of this kind which grew nearest the centre of the tree will always show a tendency to become convex, and the opposite one concave, if placed in a situation where both two edges, being abutted against the floor from the same tree; and the latter consequently contract more longitudinally in drying than the former, and the edge of every board (that has been cut with surfaces nearly parallel with the line of the converging cellular processes) which lay nearest the medulla in the tree will therefore in drying become convex, whilst the opposite edge will become concave.'

From these remarks it may be presumed that while, where flatness of surface is the principal object, a piece of wood cut like BD, Fig. 1, is preferable to one cut like AC, the latter would be preferable where the permanent straightness of the edges is of the greatest importance, because the fibres near its two edges, being relatively distant from the pith or medulla, will shrink equally, while in BD those at the edge B will contract more than those at the edge D.

By paying due regard to such circumstances in the selection of wood, the joiner may arrive at a great degree, evade the inconvenience arising from irregular variations in the dimensions of his material. As an illustration of the application of such knowledge we may refer to the method described in Dods's 'British Manufactures,' series 4., p. 211, in Knight's 'Weekly Volume,' as occasionally adopted in the formation of large deal table-tops, for veneering with mahogany or rosewood. Owing to their great weight, in various circumstances, such boards or slabs are peculiarly liable to warping but the tendency is guarded against by selecting those as free
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. With the glue thoroughly set, the whole compound board, thus produced is again cut up into slits, by sawing it longitudinally midway between the joints, and these slits are rejoined, with a further change in the order of placing the pieces. The result of all this is that the pieces are 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 doors for drawer decorations, which are commonly built up, and were, 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 impossible to a housekeeper of the atmosphere. From experiments made by M. Rondelet, 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 4\(\frac{1}{10}\) to 4\(\frac{1}{2}\) part of its width, and in oak, from 4\(\frac{1}{10}\) to 4\(\frac{1}{5}\) part of its width, showing a mean variation equal to 4\(\frac{1}{2}\) part of the width in fir, and 4\(\frac{1}{5}\) 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\(\frac{1}{2}\) inches wide would be \(\frac{1}{8}\) 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 panellings 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 Doors, P. C., p. 86, affords a good example of panellled work, and one in which this peculiarity may be readily observed. In this kind of door the styles, marked 2, 2, in the cut referred to, the rails, marked 4, 4, and the mouldings (or, as they are frequently called by workmen, the moldings), 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, would have been cut in a paneled door of the thickness of the framing. The panelling are slid, before the framing is completely put together, into grooves, ploughed or cut, about half an inch deep, in the inner edges of the framing, which grooves these 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 panel shrinks or expands. The usual practice is to fit them just so tight that a little force applied to the edge of the panel 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 panelling and windows, 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, notwithstanding the care taken to season them previously; and the shrinkage, if properly 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 of glue or nails to hold the panel in its place would occasion a similar shrinkage, but if it be 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 of glue or nails to hold the panel in its place would occasion a similar shrinkage, but if it be 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 of glue or nails to hold the panel in its place would occasion a similar shrinkage, but if it be 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.

In some cases partitions, wainscottings, and other pieces of joiner's work are framed and panelled in the same way as ordinary doors, the panels themselves being, when too wide to be cut out of a single board, composed of two or more pieces of wood, the joints of which are by no means free from warping. However, that such panels should never be made more than fifteen inches wide and four feet deep, and not so large if it can be avoided. A similar construction is also adopted in superior doors for the frame of the panelling, and in the cases, &c., as the plan is more effectual than any other for the exclusion of dust. By dividing the width of the back into two or more portions, it reduces the amount of possible shrinkage at any one joint; and if the panels be made to enter the grooves of the framing only a quarter of an inch at each side, each panel may shrink nearly half an inch without producing any aperture between the panel and the framing. A simpler but less effectual mode of attaining the same object, which is often adopted for the backs of furniture, and for some other purposes in which an extended surface of boarding, is required at less cost than is involved in framing and paneling, is to fix a series of narrow boards side by side, securing them with a few nails only, without glue, in order that they may retain as much freedom of motion as possible; and rebating the adjoining edge, as shown at a, a, Fig. 2. By this arrangement a considerable amount of shrinkage may take place without producing any opening between the adjoining boards, and, if the nails be not fixed too near their edges, sufficient play may be allowed to prevent the wood from cracking.

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 firn or wide groove on the opposite side of the boarding. The same means of avoiding the disfigurement of the opening joint is adopted in some doors and shutters which are framed and panelled in the usual manner, but in which the panels are made two-thirds instead of one-third of the thickness of the framing, and are therefore cut out to obtain the thickness of an ordinary panel, and the rebated portion alone is inserted in the grooves of the framing, while the unreduced portion of the panel 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. 3, is shown another mode of jointing boards side by side, which is called match-paneling, and is applicable to doors, or stuff, or of exceeding half an inch in thickness. This plan is frequently adopted for the kind of inferior doors called lensed 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 as masked by a bead, consists of a tongue cut in the end of one of the boards, 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 the joints, and are occasionally do with a noise sufficiently indicative of the irresistible force with which the change of dimension takes place. In superior doors the edge of the framing and the face of the panel is occupied by a moulding, put in with mortised joints, which are explained below; in such a case, the use of the tongue is not necessary, and the joints may be made to enter the framing only a quarter of an inch at the edges, without touching the panels. In bad work they are often driven carelessly into both, and the almost inevitable consequence is that the panels crack, in consequence of their freedom of motion being interfered with.

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 objects be held perfectly rigid, as for the purpose of forming a surface, or making the wood serve as a frame for various purposes. By the framing in works of joinery depends wholly upon the joints.

The simplest mode of uniting two pieces of wood is to cut the meeting surfaces so as to fit each other accurately, and to cement them together with glue. (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 simple contrivance called a shooting-board, which is a flat board with a perfectly straight edge, and with a cross-piece fitted on one end at right angles with that edge. The cross-piece being on the board, the panel is laid down upon it, with its end against the cross-piece, 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 so fitted to the edge of the panel, being thus made true, are smeared with hot glue, and one edge 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 squeeze all that is superfluous out of the joint.

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 such cases to fix the board edge ways, 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, and a greater impossibility of applying the rubbing-downs 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 article up in an iron cramp, by weighting, or by wedging. From a carefully conducted experiment by Mr. B. 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 Experiments and Appendix on the Theory of Machinery and Mechanic's 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 frame was formed of two pieces of beech, each four inches in thickness, and each piece was fitted into a rectangular box, the sides of which were formed of two separate cylinders of dry ash-wood, the ends of which presented a surface equal to 1·76 square inch, and which were glued together end to end, and allowed twenty-four hours to set. The box was then put into a horizontal position, 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 than 715 lbs. per square inch, while the cohesive strength of the wood thus united, in a lateral direction, was found to be only 659 lbs., thus showing that, if the joint had been between the sides instead of at the ends of the pieces of wood, the wood would have gone way before the joint. In this, however, the glue was newly made, and dried very fast; while in some former experiments, 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 350 lbs. to 500 lbs. per square inch. In all these experiments, Mr. Bevan found the cohesive force of solid glue to be equal to 4000 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 active action, and a greater thickness of the joint than in the experiment above described.

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 joiner pale-colored glue is preferred, as it is paler new and has a less apparent joints. Owing to the use of a darker material, and the less frequent employment, at 2½ lbs. in joints exposed to the

eyes, the colour of his glue is a matter of less importance to the cabinet-maker.

Next to the formation of joints by the simple interposition of glue between the meeting surfaces, we may note the use of nails or pins of metal, so inserted as to enter both pieces, and to bind them together with a force equal to that required for their extraction. Mr. Bevan's experiments on the adhesion of nails, and of screws, which are often used in the various kinds of nails, driven into dry Christiana deal, at right angles with the grain of the wood—

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<td>Fine screws</td>
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<td>Dito</td>
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<td>Three-penny brads</td>
<td>618</td>
<td>1·26</td>
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<td>Caesar nails</td>
<td>72</td>
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<td>Sixpenny nails</td>
<td>73</td>
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<td>Dito</td>
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<td>Fivepenny nails</td>
<td>119</td>
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The amount of power required to force a sixpenny nail, of the dimensions above given, into Christiana deal, by simple pressure, which affords the most accurate test of the resistance to be overcome, when working with a single inch and a half of deal, is—

One quarter of an inch, a pressure of 24 lbs.
Half an inch                         76 lbs.
One inch                              235 lbs.
One inch and a half                   490 lbs.
Two inches                            650 lbs.

In the above experiments, it must be remembered, the nails were driven transversely, or across the grain. The same nails, driven endways, or longitudinally, in the same wood, required a force of only 87 lbs. to extract them from a depth of one inch, and 267 lbs. from a depth of two inches; showing that a nail driven endways into deal has rather less than one-third the adhesion that it has when driven across the grain. In dry elm the hold of the same kind of nail was found to be greater than in deal in both directions, but especially when driven along the grain; the force required to extract it from a depth of one inch, when driven transversely, was 287 lbs., and when driven longitudinally 257 lbs., the relative adhesion in the two directions being in this case rather less than as 3 to 4, whereas in deal it was more than 2 to 1. Experiments with the same kind of nail, driven also to the depth of one inch (transversely, we presume) into dry oak, showed that the force required for extraction was 507 lbs.; in dry beech, 687 lbs.; and in green sycamore, 312 lbs. Mr. Bevan's experiments on nails, and screws, and the effects of different grains, and modes of finishing, are referred to in the 'Philosophical Magazine,' vol. xxii. p. 168, appear to have been made with wrought nails, which, for the ordinary purposes of the carpenter and joiner, have been in a great measure superseded by wrought nails driven directly through from thin sheet metal, and subsequently headed by a separate machine. Such nails are cheaper than wrought nails, and, owing to their greater accuracy of form, their sectional form being a perfect rectangle, with sharp defined angles, they are better held in the wood. They are stronger than wrought nails; but, being softer and more easily bent, they are not adapted for using with hard woods. The simplest method of forming an angular joint, to be held together either by glue, or by nails or screws, or by a combination of gluing with nailing or screwing, is by the arrangement shown at a, Fig. 5, where, however, if nailed, can only be nailed in one direction. For rough work such a joint may do very well, although it is unsightly in consequence of showing the end of the grain of one of the members of the joint, and of the liability of the joint to a little shrinkage 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. 5, or, by converting the whole joint into a shell-joint. Bevelled edge, 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 at Fig. 5, which is called a shell-joint, is no better than the other; it is merely more or less fine, for the joint is nowhere exposed to view, and it allows nailing in both directions; but it is not so secure, and, owing to the
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 superfluous 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 plane 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 plane, or smooth, 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 nester, where the angle alone is visible, than the former, and stronger than the latter, to which it may be nailed both ways.

Fig. 4 illustrates an arrangement almost too simple to need explanation, by which the strength of a nailed joint of the over-lap kind may, with very little extra trouble, be greatly increased. Simple as it is, however, it is very rarely practised in this country, and, indeed, has never been seen by the writer existing in tobacco-cheese or packing-cases from America. For nester purposes it might be worth while to divide each joint into four or more portions, instead of two only, as in the cut, by 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 the writer. 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 object is attained far more perfectly by the various modes of dovetailing, the simplest of which is illustrated by Fig. 6, in which a is present, in isometric perspective, a portion of two boards, such as two sides of a box, or the back and one side of a drawer, cut ready for fixing together by an ordinary dovetailed joint, and c shows the joint as it appears when fitted together. It will be evident that, when thus united, the wedge-shaped projections from the end of the piece a (from the transverse sectional form of which, somewhat resembling that of a dove's tail, the joint takes its name) must powerfully resist any strain tending to separate the joint, unless that strain happen to be exerted precisely in one direction; while the accu-

rate fit 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 glue is not arranged corresponding with a in the cut, shall fail in one of the pins, and not all of them, and if in the piece a 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 the piece forming the front of the drawer is made thicker than the sides, 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 piece 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 very secure, but the means by which it is rendered so are 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 tenant, 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 the 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 is 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 lock 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 a case, if the wood be thick, dored, or pins inserted half-way 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 Fig. 8, the grain of which runs at right angles with that of the board. The connection between the board and the clamp 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 clamp are mitered into the board, as at e, Fig. 8, which is called a miter clamp, and in which both the tongue and the tenons, if tenons are used, may be made invisible.

Where it is necessary to curve boards by softening them, by boring 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 much more than a passing reference to the large subject of geometry as applied to the joiner's art; a subject which is treated at great length in the practical treatises of Nichol 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 Joiner and Cabinet-maker, alluded to near the commencement of this article, will be found an admirable preparative for more expensive 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 account are given under Saw, P. C., p. 476; Domino Instruments, P. C. S., p. 225; and Beyer, 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 loosened 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 heel or hinder end of the stock with a hammer, or by striking in like manner on the upper surface of the front end of the stock. In planing a board to a smooth surface the work-

man commonly uses three planes: first, a coarse one, which takes off thick shavings, called a jack-plane; then one adapted for taking off very thin shavings and having a very long stock, called a try-plane. The author of 'Joiner and Cabinet-maker' thinks that this name means trueing plane; the object of the instrument being to make the surface perfectly flat or true; but the ordinary name is still more applicable, since the workman when 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 face, permit the tool to work as with a straight-edge, prevent the plane from bitering 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 plane he knows that the face 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 irregular, 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 rebating, 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, head or moulding required. In many planes of this character, which have an immense amount of work, both in the making and using, 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 irons 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; 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 and some other hard woods, it is more difficult to avoid meeting the grain, as it will not be found very conveniently the 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 furnished with 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 try-plane and smoothing-plane, if not his jack also, are likewise furnished with these double irons to be ready to use with hard and cross-grained woods; but when he met a truly cross-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.' The cabinet-makers' planes are made of a tapering iron, for the better holding of the joint; and among the planes peculiar to his business is the tooling-plane, which has a nearly vertical blade with a notched or serrated edge, for the purpose of levelling 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, 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 and Mitchell's Manuscript, in 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, as well as lamp black, which is usually made of gun-shell, gum-seedlac, and Venice turpentine, mixed in various proportions and dissolved in spirits of wine; but as those matters do not, strictly speaking, belong to the art of joinery, an incidental reference to them in this place is sufficient.

Jones, John, LL.D., was born in the parish of Llandin-egat, in Caernarthenshire, where his father was a respectable farmer. He was educated at a grammar-school and afterwards became a student at the University New-
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 Flymbury, near the University place, where he remained two years. He then became the pupil of the Unitarian congregation at Halifax in Yorkshire. In about three years he removed to London, where he resided during the first five years of his life, chief of his committee, and teaching, and preaching occasionally in the place of others: he never took charge of a congregation. Soon after he came to London he married the daughter of Dr. Abraham Hume, of the Free Church in the Strand, but issue out of that again, and had two children. He died January 10, 1827, in Great Coram Street, London, and was interred in the burying-ground of St. George's Bloomsbury. 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, founded on circumstances peculiar to our Lord and the Evangelists.' London, 1806, 8vo. In 1803 he published a short Latin Grammar for the use of schools; in 1804, a Greek Grammar, which has been frequently reprinted, but the year before his death he removed and changed the title of 'Elements of Greek Grammar.' In 1812 he published a Latin and English Vocabulary, which he republished in 1825 as 'Anthologies Latinae, or a Development of the Analogies by which the Poets of Greece have been Covered from each other.'

The success of Dr. Jones' Lexicon was great, and a large impression was soon disposed of. The work, as might be expected, was not without its faults, and was roughly treated by the learned. The name of the author was, however, a guarantee to the communicative and the initiatory.

Dr. Jones' chief work, to which he devoted a great many years of his life, was his 'Greek and English Lexicon,' which was published in 1826, in one volume, 8vo, and again in 1826. 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'.' He afterwards abbreviared the medium for schools, 'The Tyro's Greek and English Lexicon.'

There have been several Greek and English Lexicons, not only in England, but in America. Soon after Dr. Jones' came out, Schrevelius' Lexicon was translated into English, and published by Valpy, a new edition of which came out in 1831. In 1826 Dr. Donnagan's Greek Lexicon appeared, and since that of Groves, Ewing, Dunbar and Barker; Hill'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 (1845) reached a second Edition. It is based on the German work of Littell.

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Josquin, Desprez—the name which it appears to us, after having collated various authorities, is the true one of this celebrated composer of the most ancient school of par-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, while its date still remains a matter of inference; 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.

Josquin was a disciple of John Ockenheim, 'the eldest composer in parts on the continent,' says Dr. Burney, 'to whose works I have been able to find any remains,' and much of whose reputation arises from his having been the instructor of the songs by which it is known; the master and scholar were relatively 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 Josquin went into Italy with another of the same name, and there improved himself in the knowledge of his art; and this may have led to his having been thought a native of that country, a supposition to which the frequent addition to his name of Italian, or the word "del," 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 1484, for Adami speaks of him, in that capacity, in high honour, as well as of his conduct, calling him 'uomo sparse, per 'l invenzione.' Quitting Italy, he was, according to Grassepain, appointed Maître de Chapelle to Louis XIV., for whom he composed much music (containing, whose many amusing stories are told), and a motet or two or three was contrived for the dedication at the King's 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 'Memor esto verbi tu,' &c. This was not written by a less gifted than Josquin, for, on the words, 'Foroio me non est in terris viventibus;' Louis then took the hint, bestowed a benefice, and the composer expressed his gratitude in a third motet, commencing, 'Bonitatis maxime dedicato.' But the motet's remarks that desire proved more inspiring than gratitude, for the two first works very much surprised the past. 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. Hawkins gives a synopsis of them; Burney names 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 inventor almost even of counterpoint.'

JOUVENET, jean, a celebrated French painter during the reign of Louis XIV., was born about 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 1673 procured him his election into the Academy of Painting, for a picture Father before Abbeau, which is one of the best paintings of the Academy collection. Jouvenet had obtained considerable distinction two years previously by his picture of the Lasso Man painted for the so-called Duc de Seville, or Le tableau du Mal of 1675. The May Picture is 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 bust 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 no faith in an excellence that could be acquired out of Italy. The style of Jouvenet is perhaps more of 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. The works of Jouvenet are chiefly in light and shade, but in expression he was never great.

Jouvenet's last work, the Visitation of the Virgin, or Le Magnifique, in the cathedral of Notre Dame, was painted with his left hand in 1717. He had a paralytic stroke in 1713 and lost the use of his right hand, but upon the first trial he found his left as good as if the right had been; 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, the Resurrection of Lazarus, the Sellen driven from the Temple, Christ in the House of Simon the Pharisee, and the Descent from the Cross. The first four have been worked in tapestry of the Gobelin, and they have all been engraved, as have also numerous Journeys best works, by some of the best French engravers—by H. S. Thomasin, J. Audran, E. Picard, L. Desplaces, A. Loir, A. Trouvain, and others. There are works by Jouvenet in many of the churches of Paris, and many pieces. Of his mural paintings the principal are the colossal frescoes of the Apostles painted on the dome of the church Des Invalides.
sib: success, and was at an early age admitted a member of the Society of the Jesuits. He devoted himself chiefly to history, and is the author of the 6th part of the history of the Jesuits from 1591 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 impudently relied on. So he has only produced the 3rd part of the history of the Jesuits, an apology of the Jesuit Guignard, who was executed in the reign of Henry IV. of France, on account of his participation in the attempt made against the life of that monarch by Jean Clouet. He was convicted of the crime by the evidences and censured writings of Guignard. An abridgment of his history was published at Liege in 1716, which is now rarely to be met with. The other works of Jouvenel are—1, A Collection of Cases, in the Courts of Law and Equity, consisting of 3 volumes, published at Paris. 2, A Collection of Cases in the Courts of Law and Equity, consisting of 2 volumes, published at Brussels, 1709, 1710. These include some cases, but contain too superficial an abridgment of mythology. 3, A Collection of Notes on Horace, Persius, Juvenal, Martial, and the 'Metamorphoses' of Ovid, which is considered his most valuable production. He died at Rome in 1718, while engaged in the continuation of the History of the Jesuits. His name is mentioned in the art. Jansenists, P. C., among the distinguished members of that Society.

JUDGE (from the French juge, which is from the Latin iudex). [Dixc: P. C.] A judge in England and Wales is a man who presides in a court duly constituted, declares the law, explains ambiguous terms of an act, interprets precedents, pronounces 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 Insolvency Court, judges in the Ecclesiastical and Admiralty Courts, and some others. Some judges are called Recorder, and there are other names, but the name does not alter the nature of the office. When the judges simply are spoken of, the judges of the superior courts of common law are meant. There are fifteen judges of these 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 Equity. [Courts, P. C.; Equity, P. C.]

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 Wm. III. c. 2). Formerly their commissions ceased upon the demise of the crown, but by the 1 Geo. III. c. 23, they continue to hold their offices during good behaviour notwithstanding any demise of the crown, and their salaries are paid. They are also paid allowances out of the office. The judges of the courts of Equity are also appointed by the crown. [Chancellor, P. C.; Chancellor, P. C.]

By various acts of Parliament retiring pensions of a determinate sum are given on retirement of the judges of the three superior courts of law, and to the judges in Equity. The lowest retiring pension is 3500L, and this amount may be given to all saline judges of the three courts. The highest retiring pension of 10000L is given to the judge of the Exchequer, the lord chancellor, or the chief justice of the common pleas, on his demise, and is paid by 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 for 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 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 the judges of the superior courts are so well protected in the discharge of their trusts as to make them entirely independent of all political and private influence, and they are paid well enough to secure them against all temptation of lucre. Accordingly an instance of negligence, error, or crime, is generally found in a judge who holds a high office, is now seldom or never heard of. The only question that can be raised is, whether the most competent persons are always appointed, and whether persons who are not all or any one wholly and lately incompetent, are much less competent than others, and sometimes hardly competent. The danger is somewhat limited by public opinion, and particularly by the opinion of the members of the House of Commons. It is that the incompetent persons being appointed is not great. But as the appointment of the judges in the superior courts of law, and the judges in Equity, is really made by those who for the purpose have a direct interest in the subject, there is a danger of favoritism. These appointments are made by the minister, and are so made that the appointments are made by the minister, and are of the minister. This evil, so far as it exists, is increased by the constitution, and is probably a much less evil than any other mode of appointment that could be suggested. The nature or form of the judgment varies according to the nature of the action, the plea, the issue, and the manner and result of the decision: 1st. If the issue be for the plaintiff. If it be an issue at law arising upon a dilatory plea, the judgment is, that the defendant or the court over him, is called a respondent. Upon all other issues in law, and generally in fact, the judgment is that the plaintiff do recover, which is called good recovery. 2nd. If the issue be against the defendant. The issue being on a dilatory plea, whether of law or fact, the judgment is, that the writ or declaration be quashed or the plea be bad. If the issue be upon a demurrer, or in the judgment is that the plaintiff take nothing, which is called a judgment nil capiat. When judgments are given by default, or confession without issue, if for the plaintiff, they are good subsequent, if for the defendant, nullum. Besides the question at issue being decided by the judgment, the costs of the suit are generally directed to be taxed
and paid by the party against whom the judgment is de-
delivery, to the party who is the plaintiff, when given of
the plaintiff, orders that the defendant 'be in mercy,' that is,
amended or fined for his delay of justice; and when for the
defendant, that the plaintiff 'be in mercy' for his false claim.
A writ called, a writ that is not liable to be taken in execution by a judgment creditor for debt or damages. The remedy was extended by the 13 Edw. I. stat. 1, c. 18 (West. 2), to the creditor over a mortgaged interest of the debtor, for which a bond called a writ called an elegit was created, including all freehold estates and interests which the debtor held in securi-
ity, or in common, and all rent charges; but copyholds were held not to be liable to be taken in execution under this writ. By a fiction of the law, judgments were considered to take effect from the first day of the term in which they were signed, and therefore a purchaser might have his estate en-
cumbered by a judgment acknowledged subsequently to the purchase. To remedy this injustice it was enacted by the Statute of Frauds (29 Car. II. c. 3), that any judge who should sign judgments, should at the time of signing set down the names of the defendant, and that such judgments should operate from the date appearing on the margin. As, however, this did not compel the plaintiff to bring in the writ of elegit, which was only a writ of elegit before the court would listen to any application to re-
move the legal impediment. Upon the same principle that it assisted the creditor who had no relief at law, the court of equity did not permit a judgment against a trustee, though a law be given in the year to affect the beneficial interest of the usufructue.

As under the last mentioned clause of the Statute of Frauds a judgment did not affect the landlord in the hands of the trustee, until the writ was absolutely deposited in the hands of the sheriff, a purchaser of the equitable estate without notice might by getting in the legal estate protect himself against prior judgments; but if the purchaser bought with notice of the judgment, no acquisition of the legal estate would protect him. Rights of redemption were decided to be not such trust estates as to be included by the Statute of Frauds, the debtor not having the sole beneficial interest.

In the case of lands contracted to be sold, the purchaser is relieved in equity against judgments entered up subsequently to the contract; and also where land is conveyed to trustees for sale, whose receipts are to be sufficient discharge, the pur-
caller will not be bound by any subsequent judgments of which he has even express notice.

But when passing the acts of 1 & 2 Vt. c. 110, 2 & 3 Vt. c. 111, 3 & 4 Vt. c. 89, the law of judgments remained in the main unchanged. By these decrees and orders of Courts of Equity and rules of Courts of Common Law, and orders of the Lord Chancellor in matters of bank-
ruptcy and lunacy, were given the security of the creditor has been extended from a moiety to the whole of the debtor's lands, including copyholds, making leaseholders bound in the same manner as freeholders. And as all lands are included by the acts, over which the debtor may have a disposing power, judgments against a tenant in tail are binding on his issue; for the tenant might at any time have aquired the entail. So also were equitable of redemption and trust estates, in which the debtor had only a partial interest. After passing this act a question was raised whether stock was comprised, in which the debtor had only a partial interest, but the stock was to be regarded as taken in by a clause of the writ of elegit, if the goods and chattels of the debtor were to be taken in execution, or the writ of elegit to his real estate, thereby changing that which was before a naked right into an equitable interest, limited nonetheless to the amount of the debt or damage for which judgment was originally en-
termed.

A judgment at the time of entering up became a general lien upon all property, real and personal, which the debtor then held or subsequently acquired, and gave to the creditor a legal right, so long as the judgment remained on the records of the court and unstayed, to enter upon and reduce into possession of the property, by bringing out the writ of elegit, if the goods and chattels of the debtor were to be taken in execution, or the writ of elegit to his real estate, thereby changing that which was before a naked right into an equitable interest, limited nonetheless to the amount of the debt or damage for which judgment was originally en-
termed.

As to personal estate, it was enacted by the 16th section of the Statute of Frauds, that the goods and chattels of the debtor shall be bound by a judgment only from the time of taking out execution. And on the interpretation of this clause it was held that chattel interests in lands were included under the term 'goods and chattels,' and were still liable in the case of a fraudulent assignment after entering up judg-
ment and before execution, a court of equity would assist the
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 their assigns. 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 enforce whatever judgment he may have obtained against a principal creditor, until 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, the joint owners, or the confiscation of the debts of the bankrupt, with such other security as may be required. The extent of such additional security is to be fixed at the rate of four per cent. on the judgment debt, as well as to the debt itself.

Old dockets which existed since the 4 & 5 W. & M. are now finally closed, and no judgment, decree, or order, by virtue of the 1 & 2 Vict. c. 110, can affect purchasers, mortgagees, or creditors, unless and until a memorandum or minute of the judgment, &c., with the person's name against whom and the date when it was recovered, is left with the senior master of the Common Pleas at Westminster, who is to enter the same in a book kept for the purpose, in an alphabetical order by the name of the persons whose estate is to be affected.

In order to keep alive old docketed judgments, it was made necessary to register them according to this provision before a certain time fixed by the act, or they would be deemed satisfied.

Under the old law a purchaser was bound by undocked judgments of which he had notice, and it would seem that an undocked judgment is now entitled to the same consideration as an undocked judgment was, it being expressly provided by the late acts that the judgment creditor shall not take advantage of the extended remedies unless the judgment be duly registered according to their provisions. [Nottc., 1 & 2 Vict. c. 110].

The transfer of property is also greatly reduced, for the 2 & 3 Vict. c. 11 requires all judgments to be re-registered every five years from the date of the last registry, otherwise they shall be treated like mortgages, and be chargeable as such upon the lands, and creditors. But here again it may be presumed a purchaser with notice of a registered judgment more than five years old will be bound by all the remedies to which recourse might have been had by the judgment creditor previous to the passing of the late statutes. The provisions for registration, it must however be remembered, refer to the remedies which the judgment creditor may have against purchasers for valuable consideration with notice; but as between the creditor and the debtor, or his representatives or volunteers, the judgment remains in full effect until twenty years from the time of entering up or last register, or in general of judgment creditors among themselves before the late acts depended on the time when they respectively sued out execution; but in a suit for the general administration of assets the judgment creditors took priority according to time of the entering up their judgments. Now as they are entitled to such remedies in equity as if the debtor had by writing charged his land, they take priority in respect of their judgments from the times of registration. It has been questioned whether a subsequent judgment creditor without notice having used out his writ of execution is not entitled to priority over an equitable mortgagee, but the point has been decided in favour of the latter, upon the ground that it must be presumed the judgment creditor had no notice of the title, and therefore liable to all prior equities. (Whitworth v. Gaugain, 3 Hare, 461.) By these statutes judgments of the courts of the counties Palatine of Lancaster and of Durham, machinists and other judgment creditors are given in the courts of Westminster. But no judgment of those courts is to affect lands in the hands of purchasers, mortgagees, or creditors, unless a memorandum of such judgment for that purpose be filed in the county court by the person who is to register the same, in a book kept for the purpose.

Judgments or orders of inferior courts of record, in which a barrister of not less than seven years' standing shall preside, may receive the same effect for the purpose of removing a debtor from a court by a judge's order to remove them into a superior court. But until execution be actually issued, they will not affect lands in the hands of purchasers, mortgagees, or creditors, except as far as they would affect them as judgments of an inferior court.

In criminal proceedings, after trial the defendant can move in arrest of judgment at any time before judgment is pronounced, but this can only be done upon error appearing on the face of the record, and no motion of this sort can be made in the defendant's absence unless a verdict is found in which the jury reserve a point for the consideration of the court. After the judgment is recorded, a writ of error is necessary before it can either be reversed or altered. Formerly no judgment affecting the liberty of the individual could be deemed pronounced in his absence, but this has been altered by the 11 Geo. IV. & 1 Wm. IV. c. 70, which authorizes the filing of informations upon trials for felonies or misdemeanours; judgment may be pronounced whether the person affected be present or absent, and in that case the judgment is recorded.

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 for forfeitures of lands or goods, or both, of the offender; others induce a disability of holding offices or fix a lasting stigma on the offender; and a large proportion are merely pecuniary by stated or discretionary fines.

On the subject of judgments see Chitty's General Practice; Stephens, On Principles of Proceeding in Civil Actions; Sudgen's Vendors and Purchasers; Frideaux, On the Law of Judgments as they affect Real Property.

JUGGARNAUTH, TEMPLE OF, in Hindustan, is situated in the province of Orissa and district of Cuttack, in 19° 47' N. lat., 85° 55' E. long., about 45 miles south from the city of Cuttack, and 811 south-west from Calcutta, direct distances. The temple, which is named after the Hindu god Jagannath, is 350 feet high, and is 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 coarse red grout, and covered with a rough coating of yellow clay. The temple is divided into three stories, and encloses an angle of space within 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 east and uniform coast where it is situated. The country, to the distance of about a mile from the sea, is a waste of deep lood sand; farther inland it consists of low sand-hills covered by a thick forest of dwarf trees. The quadrangular enclosure is at the end of the principal street of the sea port town of Pooroo, or Jagannathpoor, a place of considerable size, but ill-built and dirty. The temple has no claim to very high antiquity, and 1n the year 1676 or 1677 the temple was destroyed by the English for purposes of trade.
It is customary for numbers of congregated persons to throw themselves under the wheels, and even fathers and mothers with their children in their arms. The chariot passes on, as if it had been deserted, and evidently unprepared to convey them immediately to heaven. On this passage Professor H. H. Wilson, in his new edition of Miller's work, has the following note (vol. i. p. 416):—"It is not likely that so many people throw themselves under the chariot wheels. Mr. Stirling, who was resident in Orissa for four years, mentions, that during that period there were no more than such instances. The cause of the accident was not known, whilst the other two were cases of painful and incurable disease. But this practice is modern: Jagnannath himself is modern, and has no place in the Visnudva Paranam. It is not infrequent that those who have reached repose are struck whilst a place of pilgrimage no longer ago than a century" (that is, in 1740).

(Hamilton, East India Gazetteer: Emma Roberts, Scenes and Characters of Hindustan; Rennell, Maps of a Map of Hindustan; Mill, History of British India, by Wilson: Wilson, Sanskrit Dictionary.)

JULIANUS, SALVIUS, was probably a native of Milan. He was the great-grandfather of the Emperor Didius Julianus. (Aelianus Spartanus, Deditus Julianus.) Julianus was twice consul, and also Prefectus Urbis. He mentions his own consalship and office of Prefect Urbis and he also speaks of the manner he conducted all his laws and writings. Julianus was a distinguished jurisconsult, and one of the Consistiat of Hadrian; and he may probably have obtained the honour of the consalship under this emperor. Lactantius (c. 3) speaks of the Doctor Jurisconsultus Julianus for the Doctor jurisconsult Julianus, who was professor and authority on the jurisconsult, and he speaks of the jurisconsult Julianus, who was professor and authority on the jurisconsult, and he speaks of the jurisconsult Julianus, who was himself killed in the reign of Antoninus Placcus. The seculum of the jurisconsult was on the Via Lavicana, five miles from Rome, according to Sp Artius, and his descendant the Emperor Didius Julianus was buried in the same tomb. (Didius Julianus, c. 8.)

Salvius Julianus was a pupil of Joveneus Priscus, and therefore one of the Sahithiani. His authority was very great among the Roman jurists, and he is often cited by another writer by the Roman jurists, even more frequently than Labeo. The great work with which his name is connected was the Edictum Perpetuum, which was compiled in the time of Hadrian. [Educal Law, P. C. S.] His principal legal work was Ninety Books of Digests. There are 457 excerpts from Julianus in the Digest of Justinian, and chiefly from the work just mentioned. There are also mentioned, in the Florentine Index, Six Books Ad Minorum, Four of Fishianum, and One Book On Amilquities (De Ambiguities).

JURIEU, PIERRE, was born in 1857, and was the son of a Protestant minister at Mess, in the diocese of Blois, and nephew of Charles, Bishop of Rives and Bishop of the department of Indre, who, on the approach of age to enter the ministry, succeeded his father in his pastoral office. His reputation for leaning afterwards obtained for him the situation of Professor of Theology and the Hebrew Language at the University of Westminister. When his colleagues 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, Basnage, and Saurin; in the heat of which he manifested the same rancour which unfortunately disguises most of his polemical writings. He allowed himself likewise to fall into various errors by too much indulging a natural 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 1686. These errors, which he derived from his infidelity, were not surprising. When the great character for learning and piety, he treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two greatest theologians of their age, because they differed from him in their opinions, however high their character for learning and piety, were treated with a most unbecoming severity. Grous and Hammond, perhaps the two great...
guardians of the realm, during his absence; and similar appointments were very frequent under the early Norman and Plantagenet kings. When a king was in need of a great revenue, as was the case of King John, in his reign, he sold it to the highest bidder. 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 things which the crown could do (dictum in dicta custodia pertinet); and the same words are common in subsequent commissions. And down to the present time similar officers have been appointed under various names, and with various jurisdictions. The regent, Protector, lieutenant, or locum tenens, and regent, have been among the other names by which they have been known. Regents and councils of regency, during the monsoon of the king for a time, with the crown, are sometimes possessed of the crown; but in modern times such arrangements have been usually made by statute. Coke remarks (4 Inst. 68), that the methods of appointing a guardian or regent have been so various, that 'the surest way is to have him made by authority of the great council in parliament.'

The most familiar case of the appointment by the crown of a representative 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, known as the council of the realm.

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 of these names has been most during the last 200 years. 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 hold office till the king appointed another. The antient powers of this officer were almost regal; he performed every act of government without any previous communication with England, and which he thought was not to the interest of the crown. 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 who was appointed was never over. 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 been 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. That which has been thus tolerated is the result, not of any conduct of the lords justices, but of their duty to the crown, the chancellor, and the commander of the forces.

In England lords justices and regencies have been repeatedly appointed since the Revolution, on occasion of the king going abroad. When the crown was left vacant by his having been made by royal letters patent under the great seal, in the same manner as the lords-lieutenant or lords justices of Ireland have always been appointed. In some cases, however, the queen has appointed the person without the royal warrant, as in the case of Mary. When King William went over to Ireland, in 1688, 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 whensoever 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 and administer the regal power and government 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 to be necessary or expedient, in consequence of the regent having always in which the queen 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 council of regency, or in the council in which the queen was 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 the possession of the 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. 51. The words 'without the consent of his majesty' are altered to the words 'whose impudence to visit his German dominions,' says Coke in his Life of Walpole, i. 77, 'now became so great as totally to overcome every restraint of prudence and suggestion of propriety, and he absconded to the mere insinuation of 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 projected 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 restricting 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, the Tories, Sir Robert Walpole, and the Whigs, being all in favour of the measure. King George II. was so animated by the same spirit, and his Majesty, who was at variance with his oldest son, now interposed another difficulty, refusing to intrust the government to the crown prince, and to admit 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 expedition 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 appointment of a regency, &c. and few, if any, 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. 51-64.) Upon this the king submitted to give the prerogative to the execution 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 VIII., 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 the commission from Henry VIII. to the Protector Somerset, in 1544, and it is styled Rectrix et Gubernatrix Regni nostri. Queen Mary, the wife of William III., whose case is the next that occurs, seems, as already stated, to have had no commission of office; and perhaps, if the crown in her own right, she was not even popularly styled regent.

When George I. went abroad the next time, in May, 1710, 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 information to be found, in a printed form, on the subject of the present article. The committee state that they had four or of any earlier commission, except of the one issued in 1695, and that that was nearly the same with this of 1719, which appears to have been also the basis of a subsequent one, issued in 1729. 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 appointed to the several offices. 'His majesty, as is annually done by (Justiciar) must be the Latin term) of our said kingdom of Great Britain, and our lieutenants in the same, during our absence out of our said kingdom, till further designation in that behalf from your highness, the authority given to the justiciar, and his deputy's, to perform the functions of a justiciar, 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 the nature of their place, have been 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 create and appoint persons to the parliament there the power to exist, and 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; also to direct such authority to the lieutenant, or justices and general governors, of the kingdom of Ireland for the time being, to summon, hold, prorogue, and dissolve the parliament and parliaments in the said kingdom, and likewise to prepare and transmit the bills which may be proposed 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, consuls, and ministers of kings, princes, republics, or states, and to make and conclude treaties, conventions, and leagues thereupon; to confer, grant, and present, to all his subjects, dignity, and ecclesiastical promotions, whether ancient or in the creation; to appoint and remove his officers, appoint, and ordain, and to discharge officers, to the proper service of the kingdom; to appoint and to ordain, 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 those 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 ordinarily 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 grant by Charles I., in 1644, to Lord Herbert (better known as the Earl of Pembroke) of the office of the king's private secretary, which, after his flight, was compelled to resign by the interference of the House of Lords.

In the Lords justices, there is a further restriction 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 accompanied by a set of instructions, also printed in the Report of the Committee of 1778, 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 as 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; and that there must be no exercise of the power of 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 other executive powers. In case however they should hold it necessary to issue proclamations for the public safety, the Lords justices are authorized to fill offices immediately, and also to suppress crimes; and they are permitted to continue the sitting of parliament by short proroguations, until they should be otherwise directed under the 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, 1725, 1726, and 1727. It is strange that the Report of 1788 should notice only the second of the several regencies of Queen Caroline, in the reign of 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 1736, 1739, 1742, 1746, 1749, 1752, and 1755. 'To enable her majesty to be regent of this kingdom, during his majesty's absence, without taking the oaths,' on the 15th of May thereafter, according to Salmon's 'Chronological Historian,' the council passed the great seal constituting her guardian and lieutenant of the kingdom during the king's absence; and the same authority states her to have been appointed guardian in 1732, and regent on the two other occasions. On the 10th of April, by the 2nd anne, 1st and 2nd anne, 1752, and 1755. On all these occasions the commissions and the accompanying instructions were nearly the same with those issued in 1719.

George III., during his long reign never left England. When George IV. went to Hanover in September, 1821, nineteen guardians and Lords Justices were appointed, the Duke of York being the first. In an important article which forms the conclusion to the present part of this work, we have quoted from the writer, after stating that Lord Eldon considered it indispensably necessary that Lords Justices should be appointed upon that occasion, adds: One good effect arose from their appointment, that the king during his 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 king's regular appearances in the English parliament might be 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 opud Westmonasteriam.'

Nevertheless, no provision existed for the absence of the sovereign on such occasions was made for the exercise of the executive authority, either when her present majesty made her short excursion to the French coast in 1844, or when she made her late more extended visit to Germany (in August and September, 1845). In 1848, upon the creation of the regency, the queen was appointed regent during the minority of her son, and the intention was that Lords Justices should be now appointed? the lord chancellor, however, replied that the government had no such intention. 'On the occasion of her majesty visiting the king of France,' his lordship is reported to have said, 'the then law officers of the crown, the present lord chief baron and the late Sir William Follett, had been consulted. . . . And after mature deliberation, these learned persons gave it as their decided opinion that it was not at all necessary in point of law that such an appointment should take place. . . . In the present instance also, the law officers of the crown had been consulted as to whether it was necessary in point of law for her majesty to appoint a regency during her absence, and their reply was that it was in no degree necessary; an opinion in which he entirely concurred.' Both the speech with which Lord Campbell prefaced his question, and the subsequent article in the 'Morning Chronicle,' will deserve to be consulted.

It ought to be mentioned that the seven persons appointed in 1706 by the 4 & 5 Anne, c. 6, and again in 1707, by the 2 & 3 Anne, c. 2, and in 1710, by the 4 & 5 Anne, c. 13, to assist the king, were other persons whom the new king or queen should have named, in case of his or her absence at the time from the kingdom, are styled Lords Justices in the act, although called regents in the act. Accordingly, these Lords Justices (twenty-six in all), who actually came into office on the death of Queen Anne, 1st August, 1714, and continued till the arrival of the king on the 8th of September, enjoyed more extensive powers than any others that have
been appointed, at least in modern times. They were authorized, 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 for 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 exercise of the royal authority being prevented or interrupted by infancy, sickness, infirmity, or otherwise,' which is printed in the Journals of the House, vol. xliv. pp. 11-42. See also, besides the other sources that have been already referred to, an article 'On the Regency Question,' in the Edinburgh Review, No. XXXV. (for May, 1831), pp. 46-80. And some particulars may be gleaned from the accounts 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. 653-1297; and from the discussions on the Regency Bill from the beginning of November, 1810, to the middle of February, 1811, which nearly fill the 15th 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 8th of December, 1810, by John Lesch, Esq. (afterwards Vice-Chancellor).

JUSTICIARY COURT in Scotland. To render the historical article on this subject under the head of JUSTICIAI |  

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P. C. J fully intelligible, it may be mentioned that the High-Court of Justiciary is the supreme criminal court in Scotland. 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 committed in Edinburgh and within the district of the Lothians are tried before this court, and in cases where in other parts of the country waiting for the next Circuit Court would create too much delay, or where there is any other ground of expediency, 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 Dumfriess; the western, at Glasgow, Inverary, and Stirling; and the northern at Perths, 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 is to say, before being decided the matter may be reserved for the consideration of that court. But it is a peculiarity both of the central and circuit courts 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 objections, 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 adjudicated in the English manner by a Court of Oyer and Terminer.

JUSTIFIABLE HOMICIDE. [MURDER, P. C.] JUVENTIUS CELSUS. [CELUS, P. C. S.]
KAFFA, a country in the eastern parts of Africa, of which we have only lately got some information, and which hitherto has been considered by any European traveller, so far unknown. It is said to be of considerable extent, larger than Shoa (Arsiminta, P. C. S.), and appears to occupy the space between 3° and 5° N. lat. and 30° and 34° E. long. It contains numerous high mountains, which are separated from one another by wide valleys. Numerous watercourses drain the country, and all of them join the Goshop, 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 Zanguebar. On the north of Kaffa is Enarea, 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 Enarea, indigenous and a forest-tree. It is not stated that coffee is an article of export, but it is thought that the coffee raised in these parts grows has 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 Soocne, 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 Enarea, who exchange their goods (rock-salt, copper, and some Indian cotton) for Kaffa, brought from Gondar, for cotton, cotton-cloth, 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 of it is in small numbers, are 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 Goshop und den Ländern Enarea, Kaffa und Dicho, in the Monatsschriften der Berliner Gesellschaft für Erdkunde.)

KAIN, 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 protegé of Voltaire, who observed the natural strength of his histrionic genius, and removed him from an 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 fifteen 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 saying that "il m'a fait pleurer; mais qui ne pleure gagne." Like Étienne-Georges, whose figure 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 novel, and while it fascinated the audience, it did not at first satisfy the critics, who termed him le consolateur. 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 (kalein and sopein), 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 reflexion 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 the planes of the two plates, the two extremities of the plates were multiplied by successive reflexions so as to exhibit the appearance of a circle divided into sectors, also that the several images of a condole near those extremities were circularly disposed about these rays in the same manner, which were suggested to him 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 reflexions from mirrors inclined to one another had long before been a subject of investigation in treatises on optics; and both Baptista Porta and Kircher had given descriptions of instruments consisting of mirrors united at two of their edges, which, being opened like two leaves of a book, were capable of multiplying the images of objects. Bradley also, about the year 1717, constructed an instrument consisting of a plane of glass inclined to one another, which being placed on a drawing, with the line of section perpendicular to the paper, exhibited to the eye several images of the figures, disposed by successive reflexions about a centre. But the optical investigations alluded to are very remotely connected with the properties of the kaleidoscope; and the application of the latter to objects which may be movable and situated at any distances from the observer, render Sir David Brewster's instrument very different from and far superior to the simple contrivances of Porta, Kircher, and Bradley.

The essential parts of the instrument consist of two plane mirrors of glass, having their posterior surfaces blackened in order to prevent any reflexion of light from thence; mirrors of polished metal would, however, be preferable: each mirror is from six to ten inches long, and of a trapezoidal form; the longer end about an inch and a half long, and the shorter end about three-quarters of an inch; and the two are placed in contact with one another at a long end of each, as to form a dihedral angle, the like ends being placed together: the subject to be viewed is disposed contingently to the larger ends, and the eye should be near the opposite extremity, but a little above the line of contact. The effects produced by the reflexions of the light may be understood from the following considerations:

Let A, B, C, in the first of the figures, be the two extremities of the mirrors on the side farthest from the eye of the observer, which is supposed to be near the opposite extremity of the line of section passing through C perpendicularly to the plane of the paper. These lines A C, B C, and the sectorial space between them (which in the figure is one-eighth part of a circle), will be visible by rays coming directly to the eye; and, at the same time, rays from the line A C falling on the mirror B C at an equal angle of incidence will, after reflexion, give rise to the image C B of the line. These, with the intermediate rays, produce the first reflected sectors B C a and A C a. Other rays from the sector A C B at the surface of the mirror A C will fall on the mirror B C; and, while a portion of them arrive at such angles of incidence as to be reflected to the eye and produce the perception of the sector a C B, another portion of them will be reflected back to the mirror A C at such angles of incidence as to be reflected to the eye and cause the perception of the sector a C B'. In a similar manner the rays first reflected from B C a will, by subsequent reflexions, give rise to the perceptions of the line B C a'.

Thus it is easy to perceive that an object, as M, on A C, with its immediately reflected image M', will give rise to the appearances of similar figures at m, m', m''; and an object, as P, on A C, with an immediately reflected image N, will give rise to the appearances of similar figures at n, n', n'' also an object, as P, between A C and B C, will appear by reflexion similarly situated in all the other sectors.
If the angle A CB be 2 of four right angles, in which as is any term in the series of even numbers 4, 8, 10, &c., the number of grid, of the object will be equal to A C B, while C Y, the appearance of the line in which the mirrors meet each other, will, as in the figure, bisect the angle which is opposite to A C B; also if m be any term in the series 9, 5, &c., the number of the sectors will be m, and each of them will be equal to A C B, while C Y will coincide with the line in which the two lowest sectors join one another. It may here be easily understood that if a sector be placed in the sector A C B which is plane perpendicular to the mirrors, have its bounding-lines similarly situated with respect to A C and B C, the reflected images will be similar and equal to the original object; and the whole will be of a symmetrical pattern; but if the values of m be odd or even; but if the bounding-lines are not similarly situated with respect to A C and B C, 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 object represented in the sector corresponding to A C B 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 would be considerably less; it follows, consequently, that the eye should be near the smaller 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 objects should be exactly in a plane conjugate 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, there are a number of objects contained in the central part of the field of view, placed in 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 above 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 A C B may be distinctly visible; the eye may, however, if necessary, be assisted by a concave or convex 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 on the sectorial space A C B; or the objects were two glass plates of very thin glass, placed between two mirrors 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 other cases round the circumference of this tube. The pieces of coloured glass or other objects which were situated in the sector A C B 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 designs were produced by moving the instrument so that the light of the sky or of a lamp might fall on the objects in different directions. When the objects in the sector A C B are confined near its upper part, the instrument evidently form an annular pattern; and, on placing the two mirrors parallel to one another, the successive reflections of the objects produce one which is rectilinear.

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 importance of the instrument was greatly increased. For this purpose he caused the mirrors to revolve about a horizontal axis, and thus a new series of images 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 power, by which there were formed images of distant objects at the place of the sector A C B. These images thus became 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 varied as much as desired. This expedient is 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 point source, as, for example, a lamp, fall upon the object in A C B at the farther extremities of the two mirrors; and at the edge of the instrument is placed a lens of such focal length that the rays in each of the emergent pencils may converge upon the screen, so as to produce on the latter a magnified image of the whole pattern. The tube containing the glass plates is 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 describing beautiful patterns.

Sir David Brewster's account of his invention is contained in his 'Treatise on the Kaleidoscope' (Edinburgh, 1819): but Dr. Roget has shown ('Annals of Philosophy,' vol. xi.) that the proportions 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 turned towards the instrument. Thus if there be three, of which AC B, 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 mirror AC B shall be a triangular prism, 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. Roget gave the name of Triascope. With the second disposition the field is divided into square compartments having the hypotenuse of the triangle for their side, and these are called quadrilateral compartments. This 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 refinements of taste are too often disregarded in the purchase 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, rudely and inaccurately constructed, were sold for a trifle, by persons who tell the public that it is doubtful whether the distinguished philosopher to whom optical science is on many accounts so highly indebted derived any pecuniary advantage 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; but it is no wonder that many detailed accounts agree neither 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 Gregoriens,' par L. Rondonneau, Paris (Gérin edition), 1830, 8vo. This work gives two days of each year, from an A.D. II. 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 midnight of Paris Observatory which precedes the true annual equinox. It is to consist of 365 days, with 12 months of 30 days each (the 80 days being 0 decades of 10 years each). This year was to be divided into 366 days, the 365th being called saniesudities (a name afterwards repealed). A sixth complementary day was to be added, not according to any rule, but selon la déclaration de l'Empereur le conscript: and although it was stated that it would be necessary to add this 366th day once in four years, yet it is not even stated in what particular coming years the necessity
would arise. The first decree, dated October 5, 1798 (the new month not having been introduced), declares the year then current to be the second year of the French republic, and enacts that An I began with September 22, 1792, and An II with September 22, 1793, and so on. The second decree, fixing the months, is dated the 4th of Frimaire, An II. (November 24th, 1798). The Gregorian reckoning was restored from and after January 1, 1806, by an imperial ordinance, dated 22 Fructidor, An VIII. (September 9, 1805).

It is to actual usage then that we must appeal to know what the decrees do not prescribe, namely, the position of the leap-years. For though every period of four years was a Frimaiced, and the last year of the Prairial (March 23, 1799) is described as a leap-year (having six complementary days), yet in fact An IV., An VIII., &c., are not leap-years. The following list, actually made from the work above mentioned, must be used as a correction of that in Yass, P. C. For various matters connected with the public-debt, &c., it was necessary to construct the table up to An XXII.

When the Gregorian year is not leap-year the beginning of the months are as follows, according as the republican year begins on September 22, 23, or 24:

- Vendémiaire is Sept. 22, 23, 24
- Brumaire is Oct. 22, 23, 24
- Frimaire is Nov. 22, 23, 24
- Nivose is Dec. 22, 23, 24
- Pluviose is Jan. 22, 23, 24
- Ventose is Feb. 22, 23, 24
- Germinal is March 22, 23, 24
- Floréal is April 22, 23, 24
- Prairial is May 22, 23, 24
- Maisondieu is June 22, 23, 24
- Thermidoria is July 22, 23, 24
- Fructidor is Aug. 22, 23, 24
- Jan. is Niv. 12, 13, 14
- Feb. is Pluvi. 13, 14, 15
- March is Vent. 14, 15, 16
- April is Germ. 15, 16, 17
- May is Flor. 16, 17, 18
- June is Prair. 17, 18, 19
- July is Therm. 18, 19, 20
- Aug. is Thermid. 19, 20, 21
- Sept. is Germ. 20, 21, 22
- Oct. is Flam. 21, 22, 23
- Nov. is Brum. 22, 23, 24
- Dec. is Frum. 23, 24, 25

But when the Gregorian year is leap-year the beginning of the months are as follows, according as the republican year begins on September 22, 23, or 24:

- Vendémiaire is Sept. 22, 23, 24
- Brumaire is Oct. 22, 23, 24
- Prim. is Nov. 22, 23, 24
- Nivose is Dec. 22, 23, 24
- Pluviose is Jan. 22, 23, 24
- Ventose is Feb. 22, 23, 24
- Germinal is March 22, 23, 24
- Floréal is April 22, 23, 24
- Prairial is May 22, 23, 24
- Maysolidieu is June 22, 23, 24
- Thermidoria is July 22, 23, 24
- Fructidor is Aug. 22, 23, 24
- Jan. is Niv. 12, 13, 14
- Feb. is Pluv. 13, 14, 15
- March is Vent. 14, 15, 16
- April is Germ. 15, 16, 17
- May is Flor. 16, 17, 18
- June is Prair. 17, 18, 19
- July is Therm. 18, 19, 20
- Aug. is Thermid. 19, 20, 21
- Sept. is Germ. 20, 21, 22
- Oct. is Flam. 21, 22, 23
- Nov. is Brum. 22, 23, 24
- Dec. is Frum. 23, 24, 25

For instance, what is 14 Floréal, An XII. The republican year begins Sept. 24, 1803, so Floréal falls in 1804, which is Gregorian leap-year. Look at the third Table, and when the year begins Sept. 24, the first of Floréal is April 21; consequently, what is 14 Floréal May 4, 1804. Again, since it lies by 1800, 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 is the 12th of Prairial; therefore June 17 is Prairial 28.

Kalugew is a considerable island in the circle of Mesen, in the Russian government of Archangel, and situated on the north of the polar circle of, and they are 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 antiseptic 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 bears, foxes, &c. Except a few Samoïdes there are no settlements of men in this island, and none but 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 Ploki-Bulak, Korsakov, and some others are near to it, but not in this year, and the natives are always industrious. (Hassel, Handbuch, vol. xi.; Cunnath, Lehrbuch.)

Kalumia, a genus of plants named by Linnaeus in honour of Peter Kahl, professor at Abo in Sweden. It has a small five-leafed, rather glandular corolla, with an angular or open limb having ten niches in its sides. The capsules five-celled and many-seeded. The species are evergreen shrubs with alternate or verticillate leaves.

K. laefolius has its leaves on long petioles, scattered or throng 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, Blue-wood, Calico-wood, &c. 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 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. laefolius cause 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. Its leaves, when dried which adheres to the shoots and branches is used as a staunching remedy by the Americans.

K. angustifolia, Haulm-leaved Kalumia, has petiolate leaves, scattered or three in a whorl, oblong, obverse, rather rusty beneath, with several lateral, broad, lance linear, those at the base clothed with glandular pubescence. It is a native of North America from Canada to the Carolinas, in bogs and swamps, and sometimes in dry mountain lands. It is a shrub one or eight feet in height, with dark red flowers. It is called Shoon-Laurel in North America, as it is supposed to be very injurious to sheep. Several varieties of this plant with lighter and darker yellow 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 protection to the anthers.

They are handsome shrubs when in blossom, and are great favourites in gardens and shrubbery. They grow best in a peat soil, or they may be planted in a very sandy loam or vegetable mould. 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 be then set in a close frame, or in the front of a hot-house, till the plants come up, which 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.

(Bom. Gardener's Dict.; Burnett, Outlines of Botany.)

Kather. Guy, 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
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known. He obtained a commission in the army; and in
1805, while holding the rank of lieutenant in the 12th regiment
(Cape Regiment), he became a member of the Royal Military
College, Sandhurst. During his residence at that institution
he was promoted to a company in the 62nd regiment; and on quitting
the College he received a certificate of his having passed the
first class. He was afterwards made brigade-major of the
eastern district.

Captain Kater was first engaged in making experiments to
determine the relative merits of reflecting telescopes con-
structed of an inch of glass, and in 1781 he published his
conclusions and his conclusion was that the ratio of the illuminating
power of the former to that of the latter kind was as 24 to 1. On this
subject he wrote two papers, entitled 'On the Light of the Cassiopes,
Large One and Small One' which were published in the 'Philosophical
Transactions' for 1781.

The determination of the precise length of the seconds
pendulum, an object of such importance in physical science,
engaged the attention of Captain Kater during several years.
The methods which had previously been employed to deter-
mine accurately the centre of oscillation in an irregular and
heterogeneous body vibrating as a pendulum were found
totally inadequate to this purpose; but Captain Kater suc-
ceded in surmounting the difficulty by availing himself of a
property of that centre which had been demonstrated by
Huygens, viz., that it was equal to the point in a suspended
body be made the point of suspension, the body will perform a vibration about it in a time equal to that
in which it performs a vibration about the original point of
suspension, if the rotation of the earth is considered. Experiments
mentally obtained, is evidently equal to the length of a
mathematical pendulum vibrating in the same time as the
given pendulum. The knife-edge mode of suspension of the first use
by his friend Dr. Farewell; and the details of the
construction of the pendulum are contained in a paper
which was published in the 'Philosophical Transactions' for
1818. (Pennell, P. C., pp. 408, 409.)

A bill having been introduced into parliament for estab-
lishing a uniform system of weights and measures in this country,
Captain Kater distinguished himself by the experiments which
he had made to ascertain the length of the seconds' pendulum, for
the purpose of assigning the physical value of the English
foot; and these experiments gave for the length of such pen-
dulum, in London, in vacuo and when reduced to the level of
the sea, 39-13999 inches. At the request of the Royal Society
of London, Captain Kater proceeded, with the instruments,
in July, 1818, to Dunmose in the Isle of Wight, to Arbory
Hill, Clifton, Leith Fort, Portsoy, and the island of Unst,
which he had with an adventuress of the more important
presumably for those places the several lengths of the
seconds' pendulum: an account of the experiments, with the
computed results, was published in the 'Philosophical Trans-
sactions' in 1819 and 1820. Here is said of Clairaut's
dimension, the diminution of terrestrial gravity from the
deck to the equator; and the great accuracy with
which the force of gravity may be determined by means of
his pendulum suggested to him the hypothesis of
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
Amateurs,' &c.'

In 1819 Captain Kater received, by the author of
the 'Philosophical Transactions', a small MS. volume entitled
'the Principles of Mechanical Science,' a work
published 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.

(Goethe, 'Winkelmann und seine Jahnhunderl; Florilo,
Geschichte der Zeichnenden Künstler in Deutschland, &c; 
Nagler, Künstler-Lexicon.)

KEAN, EDMUND, was born about 1787, in London. His
father, Edmund Kean, seems to have been a stage-carpetenter;
his mother was Miss Ann Carey, daughter of George Savile
Carey, and grand-daughter of Henry Carey. (Carry, 
Henry, P. C. S.) George Savile Carey, who was born in
1745 and died in 1807, supported himself by dramatic public
lectures interspersed with the publication of various papers,
&c. He was the author of many songs and nine dramatic pieces. Miss
Carry was an actress at minor theatres and with strolling
players and in shadow shows. The Gordon's father shocked
her, and in 1808 he was married to Miss Carey, took
her name, and, probably from this circumstance, was
reported to have been his mother. He was sent to one
or two day-schools in London, but, as may easily be supposed,
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got little literary instruction. His theatrical education, however, commenced early; Miss Tisdale 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 value of which were much heightened by the story of his being the son of a tailor and 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 Tisdale and Mrs. Quick moved to London in 1760, he was left at Wrexham with the tailor's son, the actor (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 to His Majesty's satisfaction, and with such good effect that he was afterwards raised to the stage, and made a valuable addition to the company. 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.

Kea's first performance of a complete character was that of Young Norville, 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. He was then called Samuel Keaveney, his salary was 8./.-per week. From time to time till 1814, when he made his first appearance at Drury Lane Theatre, London, his life was a series of the vices and virtues, struggles, and privatists incident to the profession of his country and theatre. In 1808 he began to appear at the Haymarket with Miss Cunard, the same company in which he had obtained an engagement at Gloucester. Maria Chambers, in July, 1808, became the wife of Kea; he then treated himself, and when she was near her accouchement with her first child they travelled together on foot from Bristol to Swansea, about one hundred and fifty miles, with only four pounds to pay their expenses on the road. On the 13th of September, 1808, Howard Kea was born. In the winter of the same year they passed over to Ireland, and at Waterford Kea became acquainted with Sheridan Knowles, then an obscure actor, and of that character, according to the newspaper report, his wife, Ann Betty, the Young Roscius, he disappeared till after Master Betty had gone away. One of Kea's best engagements was at Exeter, where his salary was £2 a week, for which he not only paid the leading characters, but also the scenery, properties, and orchestra, but Harlequin in the usual pantomime and the monkey in "Peroise."

While Kea 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 essayed his usual grace and agility as Harlequin. On this occasion Dr. 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 the Drury turned up to Dr. Kea's performances, and intended to speak to Mr. Pascoe Greenfield, one of the Drury Lane Committee, in his favour. In November, 1813, while playing to a very thin audience at Dover, a gentleman who was very attentive to his performance, and who seemed to admire it, but who did not applaud. Kea saw that he was appreciated, and played his best. The gentleman was Mr. Arnold, manager of the Theatre. On the following morning Mr. Arnold engaged him provisionally on behalf of the Committee of Drury Lane Theatre, for three years, at a salary of eight, nine, and ten pounds per week for each successive year.

At this time Kea was, 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 Kea thought no more about it. When he came to London however, andElliston heard that he was to be brought out at Drury Lane, he chanced his man, appealed to Mr. Arnold, and threatened to appeal to the law, the consequence of which opposition was that from henceforward the price of the ticket was to be increased. In 1814, poor Kea and his wife and child were almost famished, not having received a shilling of salary, except £5, which were sent to him at Dorchester to pay their expenses to London.

At length, after some urging, the manager suggested that the play-bills of Drury Lane announced "The Merchant of Venice," "Shylock by Mr. Kea, from the Exeter Theatre."

There had been no previous polishing, and the house was first tried, and he was immediately attracted. He played with such a success that the character; the house was well filled, and his fame was thereupon established. On his first night 16/. were paid at the doors; on the second, 294/; afterwards the average was upwards of 500/. His performance of Othello on one occasion brought 675/. 18z. 6d. After his third performance of Shylock, Mr. Whitbread invited him to breakfast to complete his engagement for three years, at £5. 5s. 6d. a week. Immediately after the contract was signed Mr. Whitbread tore to pieces in Kea's presence, and presented him with a sketch of a new engagement, by which the Drury Lane company were bound to employ Kea and pay him 200/- per week. Not long afterwards the Committee made his present of 800/, and he received many valuable presents from individuals. Drury Lane Theatre was saved from the ruin which had previously threatened it, and rapidly advanced to a state of prosperity.

Kea's career of success, including a visit to America in 1820, was uninterrupted till his criminal connection with the wife of Alderman Cox led to a subject commitment in the newspapers. On the 17th of January, 1825, the actor of Cox v. Kea was tried, and a verdict of 800/. damages was pronounced against him. Some of the newspapers made a series of comments on unusual severity on his private 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 performances, but Drury Lane box-office failed to reinstate 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 Kea 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 always had, in the time of his prosperity, been a dissolute man, but he had now fallen into habits of almost constant intemperance. 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 better than a repetition of those he had performed before the young Roscius, he had separated from Mrs. Kea after the trial with Alderman Cox, and allowed her 500/- a year; his mother was alive, in 1832, and had from him an allowance of 500/, a year. His eldest son, Charles, was at Eton College, and when Kea found that he was disposed to become an actor, he absconded with him, and abandoned him, and the young man was obliged to take to the stage in order to obtain the means of subsistence. Charles Kea was a year or two in America; after his return his father became reconciled to him, and in 1833 it was announced that Kea would play Othello, at Covent Garden Theatre, and that Charles Kea would play Iago with him. Kea 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 kind¬ness immediately made it known to the managers. Kea 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. The son, Charles Kea, took the boldness who were very attentive to his performance, and who seemed to admire it, but who did not applaud. Kea saw that he was appreciated, and played his best. The gentleman was Mr. Arnold, manager of the Theatre.
family were retired to rest, he would act scene after scene before them, illustrating the principles by expression of countenance, gesture, emphasis, and modulation of voice, the effect which his conception of the character required.

Keill was indisputably the greatest tragedian of modern times, and the acting of his characters is still remembered. In Othello, in truth and vigour of conception, in brilliance of execution, and power of effect, was entitled to rank with the best of Mrs. Siddons's performances. It was an exhibition of everything that could be desired from the actor, and also a display of his overpowering energy and pathos, and acknowledged by a series of bursts of applause the intense sympathy which he had infused into all ranks of society and all degrees of intelligence. The scene of the murder of Fortunatus, with a comparison of the parts of other characters he exhibited the striking points rather than the whole of the character; but this prologue did not apply to his Othello. Richard III., Shylock, and Sir Giles Overreach. These characters were all permed with an intensity of passion which he exhibited with matchless energy and truth. His power indeed was in the display of character and passion in all their varied shades. In passages of declamation he had peculiarities of intonation and utterance which gave him a strong and by no means pleasing mannerism. His comedy appears to have been by no means equal to his tragedy. He played Abel Druggar on one occasion for the benefit, and though it was well received, he did not repeat it. Old Mrs. Garrick, who witnessed it, and who admitted that he rivalled Garrick in Richard III., told him that his Abel Druggar was decidedly inferior to his husband.

Keill's accomplishments in arts connected with his profession were very varied. His fencing was much admired for skilful play, but he had a dislike for the pike. He played well on the pianoforte, and sang with exquisite taste and expression.

Of his private character little favourable can be said, though, if the circumstances of his early life be considered, much may be offered in excuse. He was profusely extravagant, spending the vast sums which he received in personal gratifications, and habitually indulging in dissipation among low society in taverns which were kept open to a late hour in the neighbourhood. He was beloved in his person, and not above the stress.

(Life of Edmmond Keill, London, 1835, 2 vols. 8vo.)

KEILL, JOHN, a distinguished British mathematician and natural philosopher, was born at Edinburgh in 1761, and having received the rudiments of education in that city, he completed his course of study in its university, of which the celebrated Dr. Gregory was then the mathematical professor. In 1784 he was entered at Balliol College, Oxford, where he distinguished himself by the lectures which he delivered in private on various subjects relating to natural philosophy, principally from the works of Newton; and in 1788 he published in London 'An Examination of Dr. Hume's Theory of the Origin of Man,' and in 1790 the same work in Dublin. In this work Keill pointed out, not without some hardness, the errors into which those theorists had fallen; and the severity of his strictures drew from each of them a reply: it is easy to see how the principal disputes of Newtonians with each other, as they are described at the side of Keill. In 1700 he was elected a Fellow of the Royal Society of London, and in the same year he succeeded Dr. Millington as Sedleian professor of natural philosophy. Two years afterwards he published a work in Latin under the title of 'Introductio ad veram Physicam,' which was well received in this country, and was also much esteemed in France—it being there considered as an excellent key to the 'Principia' of Newton. An examination of it in English was published in London in 1733, under the title of 'An Introduction to Natural Philosophy.' 8vo.

In 1709 Keill went to New England with the appointment of the principal of the College who were sent from America to the expense of the British government; these persons had been induced to leave Germany, and were living in London in great poverty: he returned, however, in the following year with the inhabitants of the Society for Promoting the Study of Astronomy at Oxford. In the year 1711 he was charged by Queen Anne with the duty of deciphering papers and it is mentioned as a proof of his sagacity that he once deciphered a secret of a fisherman. Very soon after, through the advice of Kames, the Scotchman, he wrote a little book on the national language. He held this post about five years.

In 1713 the University of Oxford conferred on him the degree of Doctor of Physic, and he published a small work under the title of 'Elements of Euclid, with a treatise on Trigonometry, and one on the Nature of Logarithms.' In 1718 he published a work entitled 'Introductio ad veram Astronomiam,' which he afterwards translated into English, 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 on the Key Islands, and the other, 'Of the Laws of Centrifugal Force.' In the volume for 1713 there is a paper by him on 'The Newtonian Solution of the Vegetable Professor's Problems' and another on 'Theoremata quaedam Infinitarum Mathematicarum spectantia'; and one which is designated 'Observations on Mr. J. Bernoulli's Remarks on the Inverse Problems of Central Forces,' both of these were published in 'no 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 Laws of Attraction, Keill, 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, who, 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 evidences of what he had stated. (Cogan, Dr. Samuel, Life of Mr. John Keill. 8vo.)

Dr. Keill was not fortunate on another occasion. Entering into the war of problems which was at that time carried on between the English mathematicians and those of the Continent, he somewhat presumptuously challenged John Bernoulli to determine the path of a body when projected in a medium which excited 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 the foreign mathematician did not fail, unsparingly, 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' (Huygens's Theorema de Vi Centripetae) quibus accedunt Trigonometria, de Virtutibus Centrifugis; de Legibus Attractionum.' (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 Banda Key. There are two others 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 sources of wealth. Dr. Keill was 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 Java on the west, are built on this island, especially in the harbour of Dool, 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 Dool, but the harbour is large and surrounded by numerous docks. The native population of the island of Banda obtains from this place an abundant supply of provisions, especially cattle. The European and India goods obtained by this traffic are partly re-exported by the inhabitants to the Artoe Islands [Sunda Islands, vol. xiii., p. 291] from the harbour of Elle, which lies on the eastern shores of Great Key. This place is also remarkable for the manufacture of cocoa-nut, which is greatly prized by the inhabitants of the neighbouring groups, and preferred to all other utensils of that description. Many of the inhabitants are occupied with fishing trepang, and there arrive annually several vessels from Macassar to fetch the produce of that article. There are two languages spoken on the group, except that a part of them have embraced the Islam. This is especially stated of the inhabitants of Elle. It is further stated, that a great number of families from Banda and Ceram have set up their abode and migrated to the group, attributable to these foreigners that the native population has attained a higher degree of civilization than their neighbours.

VOL. II. T
KILIAN was born at Augsburg in 1679, and was educated as an engraver by his stepfather Dominicus 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 1687. Lucas had great command of the graver, and has been known to execute two portraits in a week; his works are very numerous.

WOLFGANG KILLIAN was born at Augsburg in 1681, was also instructed in engraving by his stepfather Custos, and, as he was a very precocious artist, was sent by a gentleman to Venice. The prints there produced are the most correctly executed of his works. He was latterly compelled by the wants of a numerous family and hard times (it was during the Thirty Years' War) to seek more permanent sources of income, and, having married a woman of quality, he accordingly executed chief portraits. His greatest work is the Celebration of the Westphalian Peace in Augsburg in 1649, in two sheets, after a picture by Sandrart: it contains about five hundred portraits, and was executed at Augsburg.

BARTOLOMEO KILLIAN, the third son of Wolfgang, was born at Augsburg in 1680, and was first instructed in engraving by his father, who afterwards by his son's request went to study with Matthias Merian, a celebrated engraver at Frankfort on the Main. From Frankfort Bartolomaeus went to Paris, where he remained a few years, maintaining himself by his own labour; and he returned to Augsburg, where he was very able in all arts connected with the graver and the etching-needle. Sandrart terms him a born engraver: his works are very numerous, but are chiefly portraits. He died at Augsburg in 1696.

PHILIP ANDREAS KILLIAN, the son of Georg Killian, closely related to the above, was born at Augsburg in 1714, and was taught engraving by G. M. Preissler 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 is somewhat peculiar and monotonous. In 1744 Augsburg, the principal city of Poland, engaged his services, invited him to reside in Dresden, but Killian preferred his native city. He however visited Dresden in 1751 for the purpose of conducting the execution of a series of mezzotints of the chief artists who had resided at Dresden before his time, and is said to have improved pictures in the Dresden Gallery—Recueil d’Estampes d’aprés les plus célèbres Tableaux de la Galerie de Dresde.' 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 150 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 Theresia, after G. von Mytens. Three days before his death he was engaged on a portrait of Pope Clement XIII, which he 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.

(Koll, Reise door den weinig bekenden zuidelijk Molucken Archipel.)

KILLIOW, 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 exercitum of the mus of Loudun, was appointed a page of honour to Charles I., and subsequently served under Charles II. in the Netherlands. He was Killian's court engraver, and invited him to reside in Dresden, but Killian preferred his native city. He however visited Dresden in 1751 for the purpose of conducting the execution of a series of mezzotints of the chief artists who had resided at Dresden before his time, and is said to have improved pictures in the Dresden Gallery—Recueil d’Estampes d’aprés les plus célèbres Tableaux de la Galerie de Dresde.' 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 150 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 Theresia, after G. von Mytens. Three days before his death he was engaged on a portrait of Pope Clement XIII, which he very nearly completed. He died in 1759.

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fessional learning necessary for his new duties. He resigned the seals on the 26th of November, 1753, and died at his seat, Berwick, on the 27th of December. Anne, his wife, daughter of Richard Seys, of Boventer in Glou- 

KING'S COLLEGE, CAMBRIDGE, was originally a foundation for a rector and twelve fellows, founded by King Henry VI. in 1440, but in 1444, by a charter of Henry VI., it was endowed for a provost, seventy fellows and scholars, three chaplains, six clerks, sixteen choristers, and a music-master (who is now also organist), sixteen officers of the foundation, two hundred and sixty members of the students, and a large sum of money. 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 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 wants of 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.

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 the college, from the power of the proctors and other university officers, and from being imprisoned. The master of the college is an absolute authority in all matters, and the college is in no sense a corporation. The college is also the only body in the city which has a bridge, called the Bridge of Bells, in its name. The college is not only the only body in the city which has a bridge, but it is also the only body in the city which has a bridge of its own. The bridge is called the Bridge of Bells, and it is said to be the only bridge in the world which has a bridge of its own.

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 buildings of the college were constructed by Dean Thurlow, and were much decayed, it was determined that a large quadrangle should be erected to the south of the chapel; Gibbons was appointed the architect. The building was commenced in 1746, and was completed in 1752. 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-gate. Beneath a domed tower, 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 crostall Hall in London, the arched terminus in perfume. It is adorned with elaborate tracery. There is a music-gallery at each end, and an elegant screen at the west end. The roof is surmounted by two stone lantern-towers, and there is an oval window filled with stained glass, to which is attached a statue of a man, which is said to represent the founder of the college,—King Henry VI. It was built in 1447, and is now 250 years old. There is also a statue of a woman, which is said to represent the first woman who was admitted to the college,—Queen Elizabeth.
The charter precludes, in the following terms, persons who are not matriculated students in the university or 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 virtue of this Act, or to be 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 here intended to be exclusively a Church of England institution; and in this respect only does it mainly differ from University College, London, which was established in 1825. There was a design of affording the advantages of a college education to persons who were not excluded entirely 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 twenty. The council consists of the governing sans and the treasurer, and a number of others. The proprietors are those who hold shares or have been donors to the amount of $300. Proprietors are entitled for each donation of $300 or upwards, 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 Law and Jurisprudence. The modern history and geography of the world, as well as the French language, are taught. In the School, the course of study is given to pupils of both sexes, and consists of lectures and weekly examinations. All matriculated students are required to attend chapel daily, and a register of attendance is kept. The School is conducted on the same principles as those of the Michaelmas, Lent, and Easter Terms. Examinations take place at the end of the Michaelmas and Easter Terms, when the students are assessed according to proficiency. The school fees of those attending the School shall be paid for the following year annually, and the fee for the following year annually, and the fee for

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 25l. a year is paid, and who, on the completion of their studies, are sent out as missionaries; and there are several others for scholarships for pupils of the college. There are scholarships have been founded for matriculated medical students. The Master and Fellows of Magdalene College, Cambridge, have given an exhibition for students of the College. In 1835 the Rev. Mr. M'Neice, of St. John's College, Cambridge, bequeathed about 5000 guineas, chiefly in Oriental literature and philosophy.

King's College forms the eastern wing of Somerset House, which was built in an uncompleted state. In 1830 the government sold this site to the college for one thousand years, on condition that the proprietors completed the building in a style corresponding to the other part of the edifice. The college buildings extend from the Strand to the Thames. They comprise lecture-rooms, a chemical laboratory, a workroom, museums of anatomy, materia medica, zoology, botany, geology, and mineralogy, and libraries, besides a dining-hall, apartments for a limited number of students, and various offices. The school-rooms are in the basement story.

Kiva, Khiva, or Khwáy, a country in Asia, forming a part of that native division which goes by the name of Turkestan, or the Great Turkestan, is situated on the east of the Caspian Sea, between 38° and 48° N. lat., and between 43° and 53° E. long. Its political boundary is not distinctly determined, as it mostly runs through deserts, inhabited by nomadic tribes, which only nominally acknowledge the sovereignty of the Khans or pay obedience to their orders. On the east, the boundary between Khiva and Bokhara is more exactly fixed. It traverses the river Oxus a few miles north of the town of Chorab. The Oxus and river, which is the boundary between the Khivan and the Bokharan tribes of the Caspian. The Caspian constitutes its western boundary. On the south of Khiva is the desert called Dassh Jowz, and
through it lies the boundary-line separating Khryva from Persia and Merv. The authority of the Khan of Khryva may be considered to extend over 3000 square miles, or over 30,000 more than the extent of the British empire in Europe.

**Surface and Soil.** We begin with the wild latham, which lies between the Caspian and the Sea of Aral, and is divided into 43° and 45° N. lat., an extensive promontory projects into the Caspian. It is called Mangishlaik, and consists of a mountain-chain, divided into three chains, which according to an estimate, by a party under the command of the late Sir W. M. Lambuil, within 100 miles of the Caspian. From this place a mountainous country extends in a north-eastern direction towards the northern shores of the Sea of Aral; but with its nature we are totally unacquainted, as we lost our appropriation and could hardly expect to get to the table-land called Oost-cort. At this ascent the mountain-masses does not appear to be more than about 600 feet above the low steppe which extends along its northern base. The country south of this mountain-tract is unknown, with the exception of the eastern part, which is called Oost-cort, and which extends along the western shores of the Lake of Aral, to which it is bounded with steep cliffs. It is a table-land, about 600 or 600 feet above the sea, and consists of a barren and desolate appearance, which probably is the reason that it has no river or wells, though it is annually covered with a thick layer of snow, and hibernates more than undulating. The scanty vegetation consists mostly of single shrubs, and some few species of Chenopodiaceae, and at some places tracts several miles in extent are overgrown with Salix arbuscula, Lin., and Atrachis, as well as with the grass. The land, however, is a rare soil, and is entirely without vegetation. This table-land terminates on the east near 42° N. lat., but towards the Caspian it does not appear to go so far south, perhaps not farther than the Gulf of Kindeer (46° N. lat.).

To the south of the Oost-cort is a depression which appears not to be many feet above the level of the Sea of Aral. It begins on the east near Kara Oorgentch, where it is only a few miles wide, but it grows wider in approaching the lake of Kuli Daria, or Kara Bogaz, where it is more than twenty miles wide. The surface of this depression is covered with a minute sand, similar to that found at the bottom of the sea. It is therefore supposed by some writers that the river Oxus or Amoo Deria at some period sent its waters through this depression to the Kara Bogaz. This supposition is supported by the general opinion of the natives. The lake of Kara Bogaz receives its waters from the Caspian by a narrow strait, and they are therefore brackish. According to the best authorities, the lake is more than a hundred miles in length, and between twenty and thirty miles across. The lands and the adjacent countries are arid.

Above thirty miles from the lake, and south of it, is an isolated mountain-range running east and west. It extends along the northern shores of the Gulf of Balkhun, and is also said to extend along the same line, but on the north-east. The same mountain chain has a greater elevation, but north-east of the innermost recess of the bay are some summits called Great Balkan, which appear to attain an elevation of at least 2000 feet above the level of the sea. This is also the case with the mountains which extend southward, and encloses the bay also on the cast, where it is known by the name of Littino Balkan. At its southern extremity, south of 40° N. lat., another depression is said to exist, by which it is supposed that the Oxus may have discharged its waters into the Caspian, but this fact rests on information collected from the natives. Between 40° and 39° N. lat. the Caspian is skirted at a great distance from the shores by a chain of mountains, which do not appear to attain a great elevation. They are called the Lambuul mountains. At their southern extremity, near 39° N. lat., the third depression is said to occur. Farther south, to the boundary of Persia, or rather to the river Atreuck, and the Gulf of Hassan Kulli, an uninterrupted ridge of sand-hillsskirts the Caspian, about ten miles from its shores.

The mountain ranges which extend from the shores of the Caspian Sea to the vicinity of the river Oxus, south of the Kara Bogaz, is called the Desert of the Truchemenes or Turcomans. With the exception of the mountains and hills already noticed, it is a great desert, as the nobility of grass is scarce or entirely wanting. There are no large flat depressions, in which lakes are generally found, of which however the greater part is dried up during the summer. The northern part of it cannot properly be called a desert. There are few trees in the western part, but the vegetation is very extensive, and the remainder consists of a loamy hard soil, impregnated with salt, which in spring and the beginning of summer is partly covered with grass; but later in the season is without vegetation. In the hot season the sandy plains, and the bottom of the valleys, in which the leaves of the bushes and trees that grow in the depressions, or bring them to the boundary of Persia, or of the cultivated part of Khryva. The southern part however is almost entirely covered with sand. This tract is called Dariq or Daria, and is about 200 miles wide. The Oxus, called in Hind, 2000 feet above the sea, and of a width of thirty to forty miles, and its winds are large and numerous.

Khryva Proper, or the cultivated portion of the Khanat, consists of a comparatively narrow tract contiguous to the course of the river Oxus, and extending from Pitskun, the most southern town of the country, to the eastern bend of the river (north of 43°), a distance of about 150 miles. Its western boundary may be marked by a line drawn from the town of Khryva to that of Kara Oorgentch, which falls short of a hundred miles of the Confluence of the two rivers. The Oxus exceeds 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. But 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 at the foot of sand-hills which divide Khryva Proper from the Caspian Sea. The Farmers of the Oxus are the Fath Mahomed Seik, and their produce consists of lucerne, which is enclosed by its arms, contains very little land fit for agricultural purposes. It is annually inundated by the river, and mostly overgrown with reeds 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. Where the delta borders on Lake Aral, it is a complete swamp all the year round. This country is so low, that probably the whole delta would be laid under water if the level of the Sea of Aral were raised a few feet.

On the east 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 Shikochodshel; it rises about 600 feet above its base, and descends gradually eastward into the Desert of Kizil Cun. Where this ridge terminates (40° 32'), the cultivated 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 Gilson, originates in the elevated mountain region which divides Lower Turkestan from Chinese Turkestan, and which, as was mentioned before, issues from a lake, called Sini-kol, which is about fourteen miles long from east to west, with an average breadth of one mile, and near 37° 27' N. lat. and 70° 40' E. Long. Tsin mentions the fact that in old times, the river Oxus to the east, but turned southward, and encloses the bay also on the cast, where it is known by the name of Littino Balkan. At its southern it is, south of 40° N. lat., another depression is said to exist, by which it is supposed that the Oxus may have discharged its waters into the Caspian, but this fact rests on information collected from the natives. Between 40° and 39° N. lat. the Caspian is skirted at a great distance from the shores by a chain of mountains, which do not appear to attain a great elevation. They are called the Lambuul mountains. At their southern extremity, near 39° N. lat., the third depression is said to occur. Further south, to the boundary of Persia, or rather to the river Atreuck, and the Gulf of Hassan Kulli, an uninterrupted ridge of sand-hills skirts the Caspian, about ten miles from its shores.

The mountain ranges which extend from the shores of the Caspian Sea to the vicinity of the river Oxus, south of the Kara Bogaz, is called the Desert of the Truchemenes or Turcomans. With the exception of the mountains and hills already noticed, it is a great desert, as the nobility of grass is scarce or entirely wanting. There are no large flat depressions, in which lakes are generally found, of which however the greater part is dried up during the summer. The northern part of it cannot properly be called a desert. There are few trees in the western part, but the vegetation is very extensive, and the remainder consists of a loamy hard soil, impregnated with salt, which in spring and the beginning of summer is partly covered with grass; but later in the season is without vegetation. In the hot season the sandy plains, and the bottom of the valleys, in which the leaves of the bushes and trees that grow in the depressions, or bring them to the boundary of Persia, or of the cultivated part of Khryva. The southern part however is almost entirely covered with sand. This tract is called Dariq or Daria, and is about 200 miles wide. The Oxus, called in Hind, 2000 feet above the sea, and of a width of thirty to forty miles, and its winds are large and numerous.
From Kilah Chup 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 (67° E. long.), its course declines more to the north-west, and in that direction it continues to the mouth of Khyva, traversing 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 it. At times there is still a mixture of sand and navigation, but not far from the boundary-line between Bokhara and Khyva, rapids are said to exist, which are full of rocks, and during low-water dangerous to be 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 Bokharian fortress of Charchi, 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 and fifty 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 reaches Khyva from which it is distant 41° N. lat., and traverses it in one bed as far as *43° 20'*, or upwards of a hundred miles. It is course is by the northern extremity of Mount Shikhsulchhil to the west, and a few miles lower down the river divides into two arms, of which the smaller, the whole length of which is run in a westerly direction about fifty miles, when it falls into Lake Ak-Cheganak. This lake is situated near the base of the table-land of Oost-coert, and at a distance of thirty 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 bread of fifteen miles. It is entirely filled with water even in 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 in the rich an hundred miles from the mouth of the Oxus, which is stunted, and where 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-Cheganak, it sends off a branch to the south-west, which is called Staraksh, and passes near the town of Kana (Old) Oorgendah, but its farther course is not known. At Kana Oorgendah 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-usak, which is one of the more than thirty small branches called Daukara. From this lake a swampy depression similar to that of lake Ak-Cheganak is stated to extend to the Aral; but this fact rests only on the information of the mountaineers of the Kara, which extends again north-west, and sends a branch, called Kara-Balik, to Lake Daukara, and two smaller ones, Kiatt Chargen and Kok-Daria, to the depression north of Lake Ak-Cheganak. farther on, at a distance of about thirty miles, the Oxus divides into two arms, of which the smaller and western, called Talidk Daria, reaches the Sea of Aral without dividing any farther, but the eastern, Ulu Daria, enters the sea by two arms, of which the eastern is six to seventy feet deep, and two feet deep, and that the place, which was formerly uninhabited, had again been settled, and contained a population of 1000.

A river like the Oxus, traversing such a level country as Khyva, 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 after having re-entered its bed, the earthy matter contained in the Oxus diminishes the fertility of the soil. To prevent inundations the banks of the river and of the larger canals have been raised considerably above the level of the country. The detritus is here and there intermixed with a kind of thin layer of mud mixed up with sand. The canals must annually be cleansed, and this is a laborious work. In spite of the embankments partial inundations are rather frequent, and destructive floods are apt to occur; for a considerable portion of the cultivated tract was laid under water, and it is stated that more than five thousand persons perished.
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, i.e. from August to April, 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 of different kinds on the river at one time.

No country in the world has so many canals as Khyva. The number of the larger canals is stated to exceed twenty. In the southern districts they run westward, but skither north to the northern territory and then run eastward again, in which, with the sand-hills contiguous to them on the west, separated the cultivated region from the Desert of the Truchmenes. Their width varies between seventy and a hundred feet, and their length is greater than can be properly estimated. 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 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 frosty weather a considerable current runs through the canals, and even at other seasons it is perceptible.

The canals are still more navigated than the Oxus itself.

Climate.—The climate partakes of that excess of cold and heat which is peculiar to the country. It is distinguished above all other parts of the globe. We have no regular meteorological observations. On the 8th of October, 1842, the thermometer stood at 90° at two o'clock in the afternoon, and the cold increased so much in the evening that the same year it fell as low as 11° below zero of Fahrenheit. The summers are very dry; rains fall rarely, but gales are frequent. Frost is commonly experienced towards the end of October, and the lakes and canals are soon covered with ice. The Oxus however does not freeze before the end of the year. In the beginning of January, 1843, the ice of the river was found to be between thirteen and sixteen inches thick. Snow does not fall in large quantities, hardly more than four inches deep at once, and lies rarely more than four days on the ground, which is remarkable, if the frost is continuous. The climate is generally healthy; but in autumn fevers and agues are endemic.

Productions.—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. On the fields are cultivated rice, wheat, barley, millet, sesame, cotton, jugari (Helenium annuum), peas, lentils, hemp, poppy, and clover; in the gardens, melons and water-melons, pumpkins, carrots, turnips, peas, onions, potatoes, and cucumbers; in the fields, hay, flax, and grain. In the northern district, which is near the Caspian, there are many lakes, where ducks and geese are reared, and by which a considerable number of salmon are caught. Apricots, apples, pears, plums, cherries, and vine, also currants. But the fruits are not distinguished by flavour, except the melons and water-melons. On the banks of the canals and ditches are cultivated poppies, and, sometimes, large fields of hemp. The large poplar trees found on the banks of the Oxus are only found on the eastern banks of the Oxus. In the lower region a plant grows wild, whose roots, moraya, are used for dyeing red.

The Truchmenes are very beautiful, and hold in great estimation, especially those which are called argamaks. Common horses are brought to Khyva 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: 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 other wild birds are rare. Of wild animals there are but few, tame goats, 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; but are not much eaten, except by the Karakalpakes, who are very fond of smoked fish. Silk-worms are reared to a considerable extent.

Gold and copper are said to exist in the Shihchodshili mountains, but are not worked. The other useful minerals are salt, asphaltum, and iron; the latter is worked by the Kirghiz. The stone quarries are near the alluvial soil, apri- cot, pears, and plums. Silk-worms are reared to a considerable extent.

Population and Inhabitants.—The whole population is estimated at 2,000,000, of which one-fourth are stated to be settlers in Khiva Proper; so that in that part of the country about one-third are Khyva, but still of semi-nomadic habits. The chibl are those of cotton, of which several kinds of stuffs are made by the Sartcs, who also work up all the raw silk made in the country, and they produce some very good articles. Worsted manufacturing is carried on by the Kirghiz, and worsted manufactures are exported to the countries of the Caspian. In some places are large manufactures of cotton-ware. Several utensils of copper are made in the country, but all articles of iron are imported, almost exclusively from Russia. In the west, the Kirghiz settled in the Khut for the exercise of the trade of blacksmiths,

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Commerce. — In a country like Khyva, whose soil supplies its inhabitants abundantly with food, whilst its manufacturers afford a livelihood only to a small number of people, it is impossible for any article of 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 a caravan going from the Aral Sea, to Kishinev, 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 revolution of Theodotus of Bactria (256 before Christ), who founded a separate kingdom in these parts. But in the second century before Christ the nomadic nations of Upper Turan began to move into the land of Turan, and took 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 our era, however, they were driven by the way 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 Karizam or Khowvuram, which appears to have remained an independent state until conquered by Genghis Khan (1218). The descendants of Gengis Khan remained in possession of the country, which continued to form an independent kingdom under the name of Khowvuram, up to 1379, when the town was taken by Timour, and the country annexed to his possessions. Khyva remained a part of Mavral-enish, or the kingdom of Samarkand, to the beginning of the sixteenth century, when a Turkish nation, the Usbecks, under the suzerainty of Shiban Khan, descended from Upper Turkistan, and by degrees took possession of the whole of Turan. Khyva, as it appears, soon became an independent state under an Usbeck prince, and has remained so ever since. A few years ago 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 Khowvuram, who knew that the Usbecks 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 farther their conquests in this disorganized country. They had the advantage of a surprise, and they were enabled to march up to Khyva, and when they arrived there it was found that one-third of the soldiers had died.

![Image](https://via.placeholder.com/150)

(Murawsky, Reise in Chitae; Humboldt, L'Aide Centrale; Russia.)

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Your pardon," answered young Klapproth, "I know Chinese." His answer was received with astonishment and distrust, but he immediately gave proofs of his having made great progress in that difficult language, and he became henceforth an object of admiration to all who had an opportunity of witnessing his extraordinary talents. He had learned Chinese secretly and without the help of a tutor. People thus saying, he first began in 1797, after he had found out a small and incomplete, but nevertheless valuable collection of Chinese books in the public library at St. Petersburg. His father, however, perceiving that he devoted his time exclusively to Oriental languages, he sent him, in 1801, to the university of Halle, with a strict injunction to study the classics of the East. Klapproth had a love for Halle, and in 1802 published the first number of his "Asiatisches Magazin." The learned Count John Potocki having heard of Klapproth, hastened to make his acquaintance, and was so struck with him that he immediately proposed to him to enter the service of the emperor Alexander of Russia. Klapproth accepted the proposition, and the count being in great favour with the czar, Klapproth was formally invited to settle in Russia. On his arrival at St. Petersburg, early in 1805, the Academy of Sciences presented him with a diploma of Adjunct, for the Eastern languages and literature, and the Russian government gave him the title of architect, being the title of this description of the lands of Persia and Turan, Count Potocki obtained for Klapproth the place of an interpreter. Klapproth actually got his commission before the appointment of an ambassador. This honour was finally bestowed upon him, when he was transferred to the embassy at Pekin. Count John Potocki was put at the head of a body of scholars who were to accompany the embassy. Klapproth set out alone, before the embassy was ready to undertake the journey, and after having traversed the Altai Mountains, and passed through Katherinenburg, Tobolsk, and Omsk, employing all his time in studying the country and its inhabitants, he finally arrived at Irkutsk, which was the place of meeting for all the members of the embassy. Klapproth was received soon afterwards at Irkutsk and Kiashta, the embassy crossed the Chinese frontier on the 1st of January, 1806. They had scarcely proceeded a hundred and eighty miles when they were again detained, Count Golovkin having refused to submit to the Chinese court-ceremonial, and after having remained a month in a miserable Mongol town, the count was informed that the court of Pekin did not wish to see him. The embassy consequently returned to St. Petersburg. Klapproth however did not accompany them, but took a solitary route through Southern Siberia, and only reached the Russian capital February 1807, after a journey of six thousand leagues, of which he had written a separate narrative. He arrived in St. Petersburg, was received with distinction, and the emperor conferred upon him the title of Asiat. counsellor, and made him a knight of the order of Vladimir, an honour which placed him among the Russian nobility. However, Klapproth had expected still greater distinctions, and the Russian government having secretly put a stop to his intended publication of his journey through the Caucasus, he began to feel uneasy in Russia. He was too frank, too liberal, and too bold to feel happy among slaves. He nevertheless prolonged his sojourn in Russia, and was active in establishing a school of Oriental languages at Wilna, and in making a descriptive catalogue of the Chinese and Mandare MSS. in the imperial library at St. Petersburg. He was sent, in 1811, to Berlin, for the purpose of superintending the engraving of the characters which were intended for printing these MSS. In 1812 he tendered his resignation to the Russian government, and after a considerable time received his discharge, with the remark that by soliciting permission to retire he had forfeited all his civic and scientific titles and privileges in Russia. In St. Petersburg however there were strange rumours afloat as to the foreigner's intentions, and belatedly he was afterwards repeated in foreign countries, that his love of rare MSS. and books went beyond mere scientific attachment. No sooner was Klapproth free than he began to bring out his journal of travel, which was afterward published in the theatre of a long and bloody war, and the learned Orientalist
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feld from place to place without finding repos for his pursuits. The Chinese went before him, and he spoke of 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 been exiled, Klaproth was one of the few who went to see 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 its services, and was engaged in the event of his return. Napoleon is said to have given France. The 'hundred days' however passed away without any notice being taken of Klaproth, and when the Bourbons returned to Paris he was in Florence, in rather uncomfortable circumstances. Klaproth was the companion of Pells Monneret de Villard, who invited him to settle in Paris, and there Klaproth lived 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, Friedrich Wilhelm III., 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 he pleased. Placed beyond all want, 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 subsequent to this time that he raised the oriental studies of France to a position of high and respected eminence, and the discoveries which established his European reputation. The life which Klaproth led in Paris, leaving his study only to plunge into the torrent of mental and physical excitement of the gayest capital of Europe, proved fatal to his health. In 1833 the symptoms of the dropsey of the chest becoming alarming, a tour to Berlin, where he was received with great distinction by the king and the people, produced a good effect; but shortly after his return to Paris he fell ill, and bodily sufferings were unfortunately accompanied by occasional derangement of his intellectual faculties. The skill of the first physicians of Paris proved ineffectual, and after long and painful trials, 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 certainly the best linguist of an age which can justly boast of great linguists. His penetration and sagacity, and the quickness of his perception, were extraordinary; clearness and perspicuity distinguish his style; and his memory was so happy and capable of retaining the most different 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 a few weeks. If we compare Klaproth with William von Humboldt, we find that Klaproth had the superiority in analytical power, while Humboldt surpassed Klaproth in the synthetical. Klaproth's brain was capable of more rapid and more extended combinations of ideas than Humboldt's, which was naturally of a kind disposition towards everybody. Yet this kind-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 impiety of ignorance or insincerity 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 any general interest. Previous to 1812 he has no published anything, and in the 'Jahrbuch der philologischen und historischen Literatur,' in 1812, being a German translation, with notes, of a Chinese inscription; and articles in different learned periodicals. The 'Reise in den Kaukasus,' with maps, Halle and Berlin, 1812-14, 2 vols. 8vo.; of these 'Travels in the Caucasus' a French translation, in 2 vols. 8vo., Paris, 1828; and in 2 vols. 8vo., 1832; 2, 'Execution d'Autunne (The Autumnal Execution), Peking, 38th Anniv. of King, 8th June, jour malheureux;' this severe critique of Weston's translations from French to English is of great value. In the Dictionnaire Chinois-Latin of Pate et M. de Guignies, Imprimé en 1813, par les soins de M. de Guignies, Paris, 1819, fol.; 4; 'Abhandlung über die Sprache und Schrifft der Uigurigen, 2nd ed., 8vo., 1818, translated into French and English, and this is a classification of the Asiatic nations according to their languages, with a comparative vocabulary of most of the Asiatic languages; 6, 'Examen critique des Extraits d'une Histoire de l'Inde, 1816, 8vo., 1823, 8vo., 7, 'Sur l'Origine du Papier Monnaié en Chine,' Paris, 1823, 8vo.; this very interesting treatise on the origin of paper-money was shortly afterwards translated into English. Paper-money was known in China as early as 119 n.c., and was in general use in the tenth century of our era, but it fell into disuse in the middle of the fifteenth century; Marco Polo mentions it 8, Tableaux Historiques de l'Asie depuis la Monarchie de Cyrus jusqu'a nos Jours,' with twenty-four maps, Paris, 1824-26, 9, 'Mémoires relatifs à l'Anie,' etc., Paris, 1824-28, 3 vols. 8vo., with maps and engravings; one of the most valuable works on Asia, 10, Dr. W. Schmidt's 'Angélique Universel, Bctriigerei,' Leipzig and Paris, 1823, 8vo.: 'Dr. W. Schmidt's alleged translation of the works of Confucius, from the language of China to their original Chinese, from the cabinet of M. de Guignies, a chain of letters, in 1826, 8vo., 11, 'Erläuterungen zu den Werken des Confucius aus der Umsprache, eine literarische Betrachtung,' Leipzig and Paris, 1825, 8vo.: 'Travels in Japan,' 1826, 8vo., 13, 'Pour st-Intelligence des Hiéroglyphes Acrologiques adressée à M. le Comte de Goullain,' Paris, 1827, 8vo.; 14, 'Chrestomathie Mandchou,' Paris, 1828, 8vo.; 15, 'Abrégé de l'Origine et des Diverses Civilisations des races humaines,' Paris, 1831, 8vo., 16, 'La Lettre sur les Découvertes des Hiéroglyphes Acrologiques adressée à M. le Comte de Goullain,' Paris, 1827, 8vo., followed by a 'Seconde Lettre' on the same subject, addressed to Mr. D. B., published in the same year; and, 17, 'Examen critique des Travaux de M. Champollion, jeune, sur les Hiéroglyphes,' Paris, 1832, 8vo. Klaproth is of opinion that although the younger Champollion deserves great credit for having improved and enlarged our knowledge of hieroglyphics, by correcting and extending the theory of Dr. Young, and discovering the significance of many new signs, yet Champollion's theory is only available for reading the names of kings and the names of persons, with respect to ideographical and symbolical signs, which, according to Klaproth, Champollion unsuccessfully attempted to decipher. The system of Champollion, says Klaproth, 'is not founded on any scientific principle; it is as if a person, whenever he think's fit, that significance which he laid down as the original meaning of the phonetical as well as symbolical characters. That scanty knowledge of the ancient Egyptian language which we have at present, is not enough to explain the degree of confidence which we can bestow upon the theories of deciphering hieroglyphics.' Klaproth, of course,
speaks of the state of knowledge of his time. 18. 'Notice d'une Mappemonde et d'une Cosmographic Chinoise, publiées en Chine, l'une en 1730, l'autre en 1739.' Paris, 1833, 8vo.; 19. 'Nipon o Del italienne, ou Annales des Empereurs du Japon, 1817-1833.' M. Isaac Tournefort, ed. and trans. by an original by M. Klaproth, and preceded d'une Histoire Mythologique du Japon,' Paris, 1834, 4to.

Among the publications edited or translated by Klaproth, we must mention the publications of the Asiatic Society of Paris, of which he was one of the founders; Gulfenstidt's Travels in the Caucasus; Count John Potocki's Travels in the steppes of Astrakan and the Caucasus; Father Della Penna's Travels in Siberia; a description of the same country, translated from the Tibetan language into Russian, and thence into French; Tinkowski's Travels to Pekin; 'Magasin Asiatique,' from 1825-27, &c. &c. Among his minor productions 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. Klaproth's contributions to the learned periodicals of France, Germany, and Russia would fill more than twenty octavo volumes. Klaproth 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 'Cours de Geographie,' d'apres les Etudes de M. l'Empereur Klaproth, Paris, 1835, in four large sheets: 'Carte de la Mongolie, du Pays des Mandchous, de la Coree, et du Japon,' Paris, 1835; and 'Memorial, or Sketch of the Policy, and Experience of M. Klaproth, left ready for the press 'Description geographique, statistique, et historique de l'Empire Chinois,' which was to appear in French and English, but has not yet been published. He published a MS. consisting of a plan of a 'Jardin Mithridatique,' 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 no hope of seeing these MSS. ever made ready for the press. A complete catalogue of all his publications is contained in Catalogue de la Bibliotheque de feu M. de Klaproth, par le Libraire Merlin, Paris, 1839, 8vo. ('Notice de M. le Professeur Nekrol des Etudes de l'Asie,' la France Literaire.)

KLEBER, JEAN BAPTISTE, according to the best authorities, 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 household of the Cardinal de Rohan, to the profession of an architect, and was sent to Paris at an early age to complete his studies. While there circumstances enabled him to render some important services to two young Bavarians, who, having interested themselves in his behalf, induced him to accompany them to Munich, and through their influence he entered the military corps. His rapid progress in science of war gained him the patronage of General Kaminzig, son of the celebrated Austrian minister of that name, by whom, at the completion of his college career, he was appointed to a confidential agency 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 Belfort in Upper Alsace.

The breaking out of the French Revolution opened to him a more brilliant career. He had taken a prominent part in a revolt at Belfort 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 action he enlisted as a private soldier in the grenadier company 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 acted for some time under General Custine, and 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 1793 he displayed considerable courage and judgment; his services being thus rewarded by the rank of general, shortly afterwards he became brigadier-general. From thence he was ordered to La Vendée to oppose the insurgent royalists; he led there the soldiers of the garrison of Mayence, on which he was appointed, and probably saved the town from the threatened attack of the French army. At the battle of Tourouj (September 19, 1793), while charging the enemy 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 coerced into a crime his humane interference in stopping the cruelties which were exerted towards the priors held in his canton, and he was forced to make a hurried and dangerous escape to the south of France; but he was finally able to escape to Switzerland. 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 rose to the rank of a general of division.

At the battle of Pierre (June 26, 1794) he commanded the left wing of the French army, and by his skilful manœuvres greatly contributed to the victory. He then marched against Mons, which he took from the Austrians, and having advanced to the right bank of the Schelde, forced the enemy back to the right bank of the Rhine. Returning towards Maastricht, 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 remarkable. In the year following he undertook the glory which attended the success of General Jordan's operations at the opening of the campaign; and he afterwards refused the command of Pichegru's army, when this general was disgraced for bolding treasonable communications with the enemy.

(From a work of A. Quéré.)

Discontented with the manner in which the Directory managed the military affairs, Kleber retired to Paris, where he spent the greater part of the year 1797, and occupied himself with the completion of his works which were left unfinished when 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. Kleber joyfully accepted the command, which contained in it all the 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 distinguished themselves in the campaigns of Jordan's operations in Syria; he there distinguished himself by the capture of the forts 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 undaunted 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 Brune. In acquiring command of the remnant of the Austrians, including his division, and of the remnants of the Mamelukes under Ibrahim Bey, the Janissaries of Aleppo and Damascus, and numerous hordes of irregular cavalry, who were advancing to the support of their king, the task proved to be a difficult one. This expedition was most opportune, for the enemy had already crossed the Jordan, and were rapidly pressing in considerable numbers towards the coast. Kleber left Nazareth with the entire body 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. Kleber 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 ranks of the squares responded to this impetuous attack, and for six hours that the contest lasted not one square was broken nor a foot of ground lost. Suc- cour at length arrived, and the battle of Mount Thabor (April 17th, 1799) terminated in the total defeat of the Turkish troops. Kleber was wounded in vain, every assault against it proved unsuccessful, and British valor, combined with Asiatic enthusiasm, was finally triumphant. (Ackere, P. C.; Bonsart, F. C.)

The British fleet, under Hawkesworth, gained a signal victory at Abukir another signal victory over the Turks; and the day after this decisive battle Bonaparte returned to Alexandria, where he learnt the capture of Cairo by the Russians and Turks, and that the close of the campaign. For M title the 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 Bertollet and Monge, who had joined the expedition for the furtherance of science. Before leaving he appointed General Kleber to succeed him 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 succor arrive within a month from the time of his departure. He was sensible that the mortality from the plague among his soldiers should amount to fifteen hundred men.

The sudden departure of Bonaparte spread anxiety and distress among his troops; the reputation of his successor, however, who enjoyed the highest confidence of the army, tended greatly to dissipate their fears. But the talents of Kleber 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 its former chief, but he committed the fault, which in his position became a crime, of openly declaring his opinions to his disaffected 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. The attempt to detach from their country, under whose administration many erroneous and exaggerated statements had been published by Foulseculine the army administrator, and presents a most gloomy picture of the state of affairs, to effect the purpose of Kleber's party was frustrated by Napoleon at St. Helena to the Count de Montholon, and is rendered the more valuable on account of the copious comments which accompany it, and which, though written in no friendly spirit, are a sure valuable testimony.

In this letter Kleber 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 asserts that the Maneuleus were dispersed but not destroyed, and that the Grand Vizier was marching from Acre to the head of thirty thousand men. Two copies of this letter were sent, one of which was the originals of the English, and was the immediate cause of the expedition under Sir Ralph Abercromby, by which the French were compelled to abandon Egypt. In justice however to Kleber 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.

Kleber, under the influence of these dissonant feelings, addressed proposals of accommodation to the Grand Vizier; though at the same time he made vigorous preparations to repulse an attack. His men being numerous increased the necessity of a negotiation. The Grand Vizier with upward of forty thousand men had crossed the desert, and, assisted by some British officers, had captured the fort of El Arish on the 26th of January, 1800, by which it was agreed that the whole of Kleber'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 Aboeular, should be surrendered within forty-five days from the time that the convention was ratified; and finally, that the Vizier should pay a sum equivalent to about 120,000l. sterling. 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, and was honourably proportioned to its terms. The Grand Vizier, however, had already before these events the British government had dispatched orders to Lord Keith, who had the command of the Mediterranean Fleet, to refuse his consent to any treaty in which it was stipulated to enslave any officers of the English navy. Before this letter from Admiral Keith reached Kleber, warning him of his intention to detain any vessel returning to Europe by virtue of a capitulation. The French commander in chief was revolted at the idea of his shore, which now presented to him of retrieving his military character. Danger revived his energies and roused his courage. He immediately ordered the evacuation of the strongholds to be stopped, and prepared to resume hostilities. In one of those animating 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 defend to the last drop of blood the honor of the empire.
Released from immediate danger, Kleber now began to direct his energies to more pacific labours, and to apply them to the administration of the conquered country. His plan appears to have been to distribute portions of the territory among the veterans of the army, and to accept the conquests followed by the British government in India in enlisting in its service the native troops. Scarcely however had he entered on this work when he became the victim of an assassin. A native of Alexandria, Sulaiman, was invited to the atrocious act by religious fanaticism and the prospect of an ample reward. He had performed the piligimes of Mecca and Medina, and his mind was deeply imbued with the tenets of the Mahometan faith. He chance to be wandering in Palestine, when the retiring remnant of the vizier's army was passing through that country, and he became acquainted with the sultan of the Janizaries, at whose suggestion he consented 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 sent several weaks 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 poison dagger, and followed Kleber several days without being able to effect his purpose, he at length determined upon unconcealing himself in an abandoned cistern in the garden attached to the mansion which the general occupied. On the night of the 20th of May, Kleber was on his way home, accompanied by Proteus, the architect of the army, and he was pointing out to him some repairs which the building required, when Sulaiman presented himself before him as a suppliant for arms; when the architect assented to his request, he seized an 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 premature vigilance of Kleber, the anxiety at the crisis of his illness, and the presence of 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 command, joined in lamenting this unforeseen event. A military commission immediately assembled to try the assassin, who boldly confessed, and even gloried in his crime. The four sheikhs, the partake of his confidence, were beheaded, and Sulaiman was impeached 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 preserved a valuable acquisition to the French Republic.

There is no military man, says Napoleon, 'who will deny that the army of Abercromby would have been defeated at 4th of June, if he had not been of 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, the general reputation of the illustrious commandant of Kleber was very favourably with those of his successor General Manou, 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 Kleber possessed the greatest talents. There was also a melancholy coincidence in their deaths: on the same day, and nearly at the same hour, that Kleber fell under the stroke of an assassin in Egypt, Napoleon, who had left that country about three months previously, found a glorious death on the plains of Marengo.

'A Kleber,' says a celebrated French writer, 'was the finest man ever born to the literary and intellectual world, 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 Flutsch and Quintus Curtius were his constant and exclusive study; he sought in them nurture of lofty minds which the narrowness of his own education had not justified; his mind was 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 under duress. His lofty sentiments, his position however, were a filial all the greater, and as such, he was magnificent, 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 under duress. His lofty sentiments, his position however, were a filial all the greater, and as such, he was magnificent, indolent, and capricious.

While the improvement of refracting telescopes engaged the attention of mathematicians it happened that Dollend, in England, proposed objections to an assumption of Euler, that when light passes from air to glass and from water to the air, the effect of its refraction is proportional to the logarithms of the refractive indices of the media. This hypothesis was entitled 'Testamen de definiendis et corrigendis aberrationibus radiorum luminis sphericis refracti, et de perficiendo telecopio dioptrico,' and published at St. Petersburg in 4to. in 1762.

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Newton's experiment on which it was founded, were impugned by Klingsiethenia, who, from his own experiments, found that the light emitted after the refractions was affected with a different colour, under the circumstances which Newton supposed that it would be wholly free from it. In 1754 he transmitted to Dollond an account of his experiments, together with some inquiries relating to the dispersions of heterogeneous light in lenses, and these papers induced that distinguished artist to have again recourse to experiments with a view of discovering more precisely the phenomena of refraction. It was the circumstance afterwards 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. A paper was published, in Latin, an edition of Euclid's 'Elements'; a translation in Swedish of Mushenbrock's 'Physics,' and two discourses, in Swedish, which were delivered before the Academy of Sciences. One of these is an Essay on the mechanical Pothend; and the other relates to some electrical experiments which had been made at that time. He was early made a member of the Royal Society of Upsal; and he was afterwards received in the Academy of Sciences at Stockholm. He was elected a fellow of the Royal Society of London in 1750; and in the 'Philosophical Transactions' for 1751 there is a paper by him on the quadrature of hyperbolas.

Klingenstierna died Oct. 26, 1785; and by order of the queen, the mother of his pupil Gustavus III., he was buried in the tomb of Dalin, who had died a short time before him.

KNAPPIA, a genus of plants belonging to the natural order Gramineae. Its leaves have an inflorescence, with a somewhat one-sided raceme. The flowers solitary; glumes not keeled, and blunt. It has 2 palis, which are very hairy, smooth, oblong, unequal, and without awns. There is but one species of Knappia. K. acriglum is a very small grass, with a slender viscid stem, in fact, in some parts of Europe, it is regarded as a weed. The spikelets, consisting of 5 to 10 closely set sessile spikelets. It is found in sandy calcareous pastures, but is a rare grass.

KNAUTIA (named after Christopher Knaust, a German botanist), a genus of plants belonging to the natural order Dipsacaceae. The inner calyx is cup-shaped, with radiating teeth, the outer one forming a thickened margin to the germen. It has a 4-flod corymb, a fruit with 4 sides and 8 little recesses, the receptacle with spinous scales shorter than the involucres.

Knibb, the Field Scabious, has its lower leaves simple, the stem-leaves pinnatifid, the inner calyx with 8 or 16 somewhat awned teeth. The stem rises from 2 to 3 feet in height, is slightly branched, and with but few leaves. The flowers small, about the size of a pin-head, have no stamens, and it is stated that it 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, November 22, 1845, 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 Missionary Society), and that in the year 1838 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 William Wilberforce, and the sympathy of many other liberal friends, that he offered himself to go out to supply the place of his deceased brother; and, his offer being accepted, he sailed, with his wife, in November, 1824. On his arrival he was appointed by the brethren of Kingston to the north-western part of the island, where he took charge of the Ridge Church Mission, a connexion with Savannah-la-Mar; and at the time of the death of Mr. Mann, another missionary of the same denomination, he accepted a pressing invitation to succeed him as pastor of the mission church at Falmouth, and to form a church at the burrington where he died.

A short time prior to Mr. Knibb's settlement at Falmouth he was brought into painful notoriety in consequence of the breaking out of an alarming spirit of insurrection among the slave population. A notion had been excited by the death of some negroes suppressed in the negroes to the effect that the King of England had determined to emancipate them from slavery, and that the free papers, as they termed the supposed announcement, had been 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 impressions 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 freedoms. Insurrectionary movements were, in spite of all the efforts of the missionaries, actually commenced by the negroes, although the interpolation of Mr. Knibb, who possessed great influence among the slaves through the circumstances of his relations with them, kept them from breaking out into open insurrection. 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 ameliorating the condition 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 office, to bridge on the island, and 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 men of the St. Ann's regiment; similar outrages, in which he was guilty of no participation in any 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, warned with enthusiasm excited 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 arrived for making his determination at the annual meeting of the Society in the 21st of June, to avow this at the risk of his connection with the Society. Mr. Knibb carried the meeting, and subse-
a menace 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 insisted on a direct and absolute invalidation of 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 establishment of an independent community and occupation for the liberated negroes; and he erected a normal school at the village of Kettering, in Tredawney, for training native and other schoolmistresses for both Jamaica and Africa. In 1842, in consequence of the prosperous state of the mission churches in Jamaica, it was determined by the missionaries and congregations to separate themselves from the Baptist Missionary Society, so far as any dependence upon the Society's funds was concerned; and in the same year Mr. Knibb visited England to promote the establishment 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 oppression, in consequence of the adoption, by the colonial legislature, 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 increased seizure of their profits, of the number of foreign labourers, so as to overstock the labour-market, and reduce the persecuted negroes to the greatest distress. Having succeeded in obtaining both sympathy and pecuniary assistance, he returned to Jamaica in April, 1846. In the following November 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, there were the regrets entertained for his 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 friends and admirers, and the bitter detractors of his political opponents, and of the men whose oppressions he expressed with such unfeigned courage, an accurate estimate of the character of William Knibb. Of a peculiarly ardent temperament, and feeling that he had undertaken the championship of a cause which demanded all the zeal and energy which could be called into exercise for the exposure of monstrous 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 residence in Jamaica, and his intimate knowledge of the state of the negro population, caused him to feel with an intensity not to be surpassed, the position of his friends in this particular, in which he laboured to abolish or to mitigate. As an instrument in the mental and moral elevation of the negro character, the name of Knibb will long be honoured by the friends of the negro race. The full account of all important transactions in which he was involved is given in the second volume of Dr. Cox's 'History of the Baptist Missionary Society.'

KNOLLER, MARTIN VON, a distinguished German painter of the eighteenth century, was born in the village of Steinach 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 circumstances 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 obtained shelter in the house of a rich man, the Baron von Hornay, at Innbruck, 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 Fögel, who thus became Martin's master. He afterwards has thought that 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 between the apprenticeship at art in sand and stone work, and in what other way he could, and in the performance of his father's domestic offices. Such was the state of affairs when circumstances brought the painter Paul Troger, on his return to Vienna from Steinach, where he had found some of the extraordinary productions of Knoeller, then twenty years of age. Troger perceived the lad's ability, and offered to take him with him to Vienna. Young Knoeller 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 Brizen; and in 1758 he obtained the commission for the frescoes in the chapel of the corporation of the Count Firmian, a nobleman of noble family, who was then ambassador at Naples, where he employed him much in that city, and in the decoration of his palace at Milan. Knoeller visited Rome several times subsequently, and contracted a close friendship with Winckelmann and Mengs. He finished his one of the most important works, the frescoes of the church of Volders near Hall, in the Tyrol, consisting of passages from the life of San Carlo Borromeo. In 1756 he returned to Milan to his former patron, Count Firmian, whose esteem and patronage induced Knoeller to make Milan his head-quarters, and he there married, in 1757, the daughter of a merchant, by whom he had nine children. Knoeller painted many works in Milan, in oil and 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 Knoeller's works. His principal German works are the frescoes in the residence of the Count Firmian at Tunbridge Wells, and the seven cupolas of the church of Neresheim in Wurttemberg, painted in 1770-75, for which he received 22,000 florins. He painted a large fresco, 110 feet by 33, in the library of Count Firmian at Milan. He did also at Vienna, and there are altars-pieces by him in several churches in the south of Bavaria. He was much engaged also at Vienna, but chiefly in portrait painting; he was there ennobled, with the title of Prince of the Holy Roman Empire. The are many of his works in the Tyrol, at Innsbruck, Bozen, and other places. The church of his native place, Steinach, possesses three altarpieces by Knoeller. He died in 1804. He was gay in his colouring, and his compositions are of a very correct and serious kind. His figures are characterised for their physical qualities—dramatic and effective composition, strong expression, and vigorous and uncommon attitudes. 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 eminent painters. A Life of Knoeller was published in the 'Beltrage zur Geschichte und Statistik von Tyrol,' for 1831.
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 at Tunbridge, Sept. 6, 1821.

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 additional essays, in 3 vols. 12mo.; many editions have since been published. The following is an extract from the Methods of acquiring Useful and Polite Learning, 8vo., 1781, enlarged in 1785 to 3 vols. 8vo.

This work was chiefly intended to point out the defects of the system of education in the English universities and public schools. It had some effect in producing a reformation, 8vo.; 'Elegant Exports in Prose,' 8vo., 1782. 'Winter Evenings, or Lectures on Life and Letters,' 3 vols., 12mo., 1785. 8vo., '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 Philosopher, 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., 1795. Dr. Knox published a few other minor works, occasional writings.

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 chiefly depended on his sermons. The 'Elegant Extracts' were made with much taste and judgment. They were very useful works in their day, and had for many years a large circulation.

(Knox, Theological and Literary, 1822; Watt’s Bibliotheca Britannica.)

KOBEI, the name of several German and Dutch landscape painters, of whom the following are the most distinguished.

Ferdinand Kobell was born at Mannheim in 1740, and was educated by his father with a view to his obtaining an honourable position in the civil service of the Electoral government. He then entered the hofkantoin, or counsel of the exchequer. Ferdinand however had an invincible passion for landscape painting, which the encouragement of the elector palatine, 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 1799. Kobell was also a very able etcher: a set of his prints, 179 in number, was published in Nürnberg in 1769.——'Oeuvre complete du peintre. Dessins de Kobell &c.' — 'Kobell: His Works.'—'Catalogue Raisonné' was published by Baron von Stengel, in which 207 prints are described. Nagler has printed a list of Kobell’s works, but they are not all selected, true in colouring, and executed with care: the figures in them are painted by himself.

Franz Kobell, the younger brother of Ferdinand, was born at Mannheim in 1749. 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 overcame all obstacles, and his brother’s patron, the elector Karl Theodor, befriended him also, and enabled him, in 1776, to visit Italy, where he remained an enthusiastic student of Italian scenery, chiefly at Rome, for nine years. Franz Kobell, though he did not make many pictures, either of oil or water-colour, has scarcely a painter sally, for his works are almost exclusively drawings, chiefly with the pen, and tinted with sepia. He was so industrious in this style of art, that the number of his etchings, which are remarkable for good taste, is not insensible. The greatest bulk of which are in three collections—that of the Duke Albert of Sachsen-Teschen in Vienna, that of H. von Rigal in Paris, and that of Baron Stengel in Munich. He died at Munich in 1797, to the crook of whose elbow he left "Kunstblatt" of the same year, from the pen of his friend Spohr, the author of an excellent work on Italian art of the earlier ages—'Die Kunst in Italien,' 3 vols. 8vo., Munich, 1813. (Mosel, Miscellanea Artistici Inferi; Lipowsky, Künstler-Lexicon; Nagler, Künstler-Lexicon.)

KOBRESIA, a genus of plants belonging to the order Cyperaceae. It has the spikelets aggregate; the lower flower pistilliferous, the perigone of one scale inclosing the germen and covered by the glumes. The upper flower staminiferous without any perianth. There is but one species of this genus, K. curvata, which has an erect stem from 6 to 12 inches in height, slender leaves about two-thirds the length of the stem, and six to eight flowers. There is often an abortive stamens at the base of the nut. This plant is found throughout Europe and in Great Britain, on moor land, in Yorkshire, cornfields, fields of Perd hair.

(Babington’s Manual of British Botany.)

KOCHEL, JOSEPH ANTON, a celebrated German landscape painter, was born of poor parents at Obereibheim, near Mainz, in the first year of the Leuchtenberg dynasty of Brandenburg in 1788. Some of his early attempts attracted the notice of Bishop Umughler, vicar-general of Augeburg, who placed Koch with a painter in that city and provided for his maintenance. He was shortly afterwards sent by the bishop to the Carl-Academie at Stuttgart, where he remained seven years, and became in the meantime an able landscape painter. Koch tried his fortune in Rome at an early date, and was met with complete success; he married a Roman girl and settled himself fixedly in Rome, where he enjoyed a great reputation for, with the exception of a short interval, at least half a century, and he was for years considered the German artists. He died at Rome, January 12, 1839.

Koch was not exclusively a landscape painter, though he is chiefly distinguished as such. He is known for some clever historical scenes, and is celebrated for his landscapes. The works of Koch are, Noah’s Sacrifice, the Emancipation of the Tyrol by Hofer, the Flight of Laban, the fresco illustrations to Dante in the Villa Massimi, besides some others. He has painted several works for the Berliners, and also a rather characteristic pictures of a peculiar class of scenery than prospects of particular localities. He frequently composed his landscapes out of such peculiarities of mountain scenery as were mingled with his individual taste, but the parts were always well arranged, and true and characteristic in their details. In colouring he was not excellent, but rather heavy and monotous. His latest works were comparatively few. Koch, although a talented and finished artist, had an admirable skill, and among his works in this class are 24 designs from the anciantable of the Arcagonic expedition, after Carstena. (Nagler, Neues Allgemeines Künstler-Lexicon.)

KOELERIA, 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 spikelets, which is compressed. The outer scales is narrowed, keeled, and acuminate; the seed loose, and the styles terminal. There is but one British species of this genus.

K. eripinnata has a compact panicle, spicate, oval, and interrupted distichous spikelet, pale. Scribed and acute; the leaves narrow, rough at the edges, and ciliated. In dry places the leaves are much shorter than the stem; in damper places elongated, and often nearly as long as the stem.

(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 3 seeds in each call, simple filaments, and 8 hypogynous glands. But one British species of this genus has been discovered, K. maritima, which is a procumbent plant, with bipartite leaves, linear lanceolate aculeate leaves, oval pointed glabrous pod. It is the Laboratory of Koch, and the Gylcy of Lindley. The flowers are white and sweet-scented.

(Babington, Manual of British Botany.)

KOTTBUS, COTTUS, F. C.

KRAFT, A. G., was an old sculptor and architect of Nürnberg, where he was born about 1450; he married in 1470. There are several of his performances still extant in the city and churches of Nürnberg, but the principal is the monuement of Luyken, erected 1514—1515. in the church of St. Lawrence, Worms. In it is the in the form of a square open Gothic spire, and is 64 feet high, the pinnacle being turned downwards, like a capital. On the south side is the gilded crown of the choir. The choir is placed immediately upon a low platform which is supported partly by the kneeling figures of Adam Kraft and his two assistants; the rail or baluster of gold, and the platform in the right is adorned, and the figures of eight saints. The whole tabernacle is also profusely ornamented with small figures in the round and bas-relief:—immediately above the choir. On three sides, are represe-
Academy, it succession Petersburg, above very changed an work. He and his service and return with him to Petersburg, but Kupetzky was obstinately fond of his liberty, and would never enter the service of any prince. The great Peter gave him a commission to return in his own service. All that Kupetzky had ever required of the Emperor of Austria was, that he might be allowed to worship God in his own way. He had been beard to 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 only his great fortune, and the intervention of the Empress, and his secretly left Vienna and settled in Nurnberg, where he died in 1740. Kupetzky painted history and portrait, but chiefly portrait. His pictures have a great deal of character and much effect: his friends and admirers says they combine the vigour of Rubens, the truth and elevation of Vandyke, and the effect of Rembrandt. Many of his portraits and some of his pictures have been engraved, especially by Bernhard Vogel; in mezzotint engraved by Vogel were added to V. D. Preissler and published in a collection in folio at Nurnberg in 1745, under the following title:—Joannis Kupetzky, incomparabilis artificis, imaginum, et tituli specimen, a quo aliquis quindecim decadas arte quam vacant nara crici iaceat, a Bernhardo Vogelo, jam vero similiter continuata opera et sumptibus Valentinis Daniellis Preissleri, Chalcographi. Kupetzky is a poet of himself, in the pursuit of his art, the work of a prolific merit, has been copied by L. de Laborde, from Vogel's print, and is inserted as a specimen in his history of mezzotint engravings.—Histore de la Grave en Maniere Noire.' J. C. Fussli published a Life of Kupetzky, with one of Rugendas, at Zurich, in 1758. (Florilo, Geschichte der Zeichnenden Künstler, &c.; Dlabac, Allgemeines historisches Künstler-Lexicon für Böhmen.) KUDEDISTAN (the country of the Turco-Turkis) comprehends 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 Ererd Tagh (39° 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 ofomerata, and from thence to the equator of the middle planet; 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 Ererd Tagh to the Ererd-Mansur, which, as it west approaches the banks of the Tigris south of Jezireh-im 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 Rondaws (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 Soli Range, but in the middle, where it attains 8000 feet and more, the El Kiar Mountains; it is still higher where it approaches the table-land of Iran. The whole country between this range and the Ererd Tagh is mountainous. In the vicinity of its northern limits the rocky masses are rarely 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 low hills with gentle declivities and small plains between them. This is the table-land of All Bagh, on which very lofty summits rise. The climate is dry and very arid, and the vegetation scanty. It is mostly used as pasture-ground in summer. In proceeding southward the country gradually rises, and the soil of the Ererd Tagh is especially fit for the raising of grain; but 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 comparatively narrow valleys between them. Some of the ridges attain a great elevation,
as the Marannan mountains, the Jawr Tagh, and the Jelooch range, in the lower half of the basin, and rise between 12,000 and 15,000 feet above the sea. The de-
clivity of the ridges and the valleys present a vigorous ve-
etation in the numerous forests and in the growth of the dif-
ferent species of plants that are indigenous in this region.

The forests chiefly consist of different kinds of oak (Quercus
valonia and Q. infectoria), from which those immense quan-
tities of gall-nuts are collected which constitute the most
important product of the district. In winter 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
the banks are more cultivated, and on the south contain
more than two miles wide, and generally not half so much.

This portion of Kurdistan is in possession of some tribes of
Kurds, which are independent when the pashas of Bag-
dad 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 is Mohammedans, and the other half Christians,
among whom the Nestorians are the most numerous. Their
patriarch resides in Julner, a small town situated in the
valley of the river Zab Ala, or Great Zab, and enjoys almost
the same kind of independence. Its government is divided
into the towns of Amadiyah and Rowandiz, the two
places whence the gall-nuts are exported. Amadiyah lies in
a valley from five to six miles wide and very fertile, and is
hailed by the Kurds as a more fertile soil than that of 90 feet
above 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 1000 houses and perhaps 10,000 inhabitants. Numerous
caravans pass between this place and Mosul. They export
gall-nuts, madder, hides, and tobacco, and bring back several
European articles.

The southern portion of Kurdistan, 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
central ranges of Turkey. The surface however is greatly
diversified by several ranges of hills. Three such ranges may
be traced between the banks of the Tigris 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
terrain on the banks of the Tigris between the town of
Tekir and the mouth of the Zab Asaf or Lacs Zab (near 35°
N. lat.); the All Tagh, south of the confluence of the
Zab Ala or Great Zab (near 36° N. lat.); and the Kara
Tagh joins the El Kbaar mountains south-west of the peak of
Ramur. It contains some forty to fifty miles, and is divided
into several places by hilly tracts. It appears however that the
greatest part of this region is occupied by plains of considerable
extent. The hills as well as the greater part of these plains are
covered with a variety of crops, mostly quinques. But along the base of the hills, partly on their declivities and
partly in the adjacent level country, there are lands of consid-
erable fertility, well cultivated, and populous. The moun-
tain-region which borders this country on the east varies from
ten to twenty miles in width, and it contains several high ranges,
as the Shabin mountains, the Azmir Tagh, and the Kurkur
Tagh. In the second month of the Persian calendar, the
largest river of Kurdistan is the Zab Asaf, or Great Zab.
It rises in the north-western corner of the table-land of
Ararat, and in a picturesque valley in the vicinity of
Batamuk, and joins the Tigris about 30 miles below Mosul.
At the place of its confluence the rivers are nearly equal in
distance. The waters of the Tigris are highest in April and May, but in July the stream is reduced to one-third of the
amount which it possessed in April. The Zab Asaf is the
largest river of Kurdistan, which, by its affluents, drains the
first-mentioned country, they fall into the Tigris; but they
break through all the lower ridges of Southern Kurdistan.

There are several considerable towns in Southern Kur-
distan. The most important is the chief town of Tigris, for
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
traversed by the river. It contains more than 2000 houses;
large mosques, and two baths. Altun Kupri, on the banks of
the Lesser Zab, contains 8000 inhabitants. Kerkuk, farther
south, is a rather large place, which contains on a considerable
commerce with Sulaimaniyah, to which place it sends large
quantities of gall-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.

Suleimaniyah, the modern capital of Southern Kurdistan,
and the residence of the hereditary pasha or wali, who how-
ever is dependent on the pasha of Baghdad. It is situated
on the base of the Azmik range, and of the peak called Pir
Omar Gudrun, which rises to more than 10,000 feet above the
sea-level. The plain of Bania, at the eastern border of
Sulaimaniyah, is 30 to 40 miles in breadth, and was early
occupied. It was built in 1785, and contains more than 2000 houses
and about 10,000 inhabitants, six caravanserais, five huts, and
five mosques. The commerce with the adjacent country is con-
siderable, and is conducted in this place.

Little is known of the climate of Kurdistan, except that of
Sulaimaniyah, where the winters are very cold and the sum-
mers very hot. Snow covers the plain of Banna for six
weeks, or even two or three months. In the winter the climate is
very agreeable, the thermometer standing at six o'clock in the
morning at 65°; at half-past one, at 78°; and at ten o'clock
in the evening at 65°, but in July the heat is very oppressive,
especially during the northern-winds which are called
sherki, and which affect the human body more than the
samour 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 sherki does not blow, the changes of the
atmosphere are very regular in summer. At sun-rise 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
gusts of wind, from the south. Later in the day it
turns to the west, and is considerably cooler.
The mornings are gene-
rally unpleasant, but the afternoons are very
agreeable.

The fields of Kurdistan produce wheat, barley, and Indian
corn; millet and rice are also grown on the borders of the
rivers. The orchards yield figs, pomegranates, olives, oranges,
peaches, plums, apples, pears, cherries, and abundance of
grapes of good quality; in some places there are plantations
of dates. Poplar and chinsh trees (plantanus 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 in-
ported from Badgad. There are bears, wild hogs, wild
goats, antelopes, and jackals. Land-turtles are frequent, but
of small size. Bees are very abundant, and honey is a com-
mon manufacture, both in the mountainous and a valley part
of the country; birds are not numerous, except par-
tridges 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 Diyahlah, from which large quantities of salt may be
obtained. Naphtha and petroleum are also found in some places in
the vicinity of Kerkuk, and some of the springs yield a considerable
revenue to the walls; they are noticed by Strabo (p. 738, 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 Sulaimaniyah 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 luxuriant productions 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, ginnel, or ginsel, silk, and manufactures of Kashan, 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 Sulaimaniyah ginnel-stuffs, honey, sheep-skins, and cattle; and exchanged for fruits, rice, leather, coffee, cotton stuffs, &c. There is also much commerce with Bagdad, where coffee, dates, and European and Indus goods are obtained in exchange for the silk brought from Tabriz, and for the produce of the country, consisting of sheep, ginnel-stuffs, sumach, cheese, hutter, gambi, towel, soap, and tobacco. These articles are also taken to Media, where they are exchanged for cucumbers and other cotton stuffs, silks of Damascus and Darbehk, stuffs for turbans, boots, and shoes. The least active branch of the commerce of Sulaimaniyah 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 those 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 population of Persian Kurdistan may amount to 20,000 individuals. But as a numerous colony of Kurds is found in Kiziloman, 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 regularly built, and attain a great age. 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 denomination. In Turkish Kurdistan the nation is composed of two castes, the warriors, called Belebek or Balans, and the working people or agriculturists, called Gurun. The latter are considered by the Belebek as a race of men totally different from them, and are treated as slaves. The Belebehs are very partial to the ground, and generally are never away from their 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 retire with their herds to the adjacent mountain-ranges, from which they return when the harvest time approaches. Though the Kurds are as good Mohammedi as their neighbours, their women enjoy much a 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 (Kapidegas), and later historians Kapidegas, Kapiadas, Gordian. 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 Guagamela (Arbela) was fought in Kurdistan, near the modern town of Arbil. After the time of Alexander their country was annexed to the kingdom of Susa, and dismembered from it in the third century before Christ by the Parthians. It afterwards became a part of the new Persian empire, and fell with it under the dominion of the caliphs of Baghdad, and was afterwards especially of the Caliphs of Marid particular to the numerous revolutions in Persia and Mesopotamia. The famous sultan Saladin was a Kurd, of the tribe of Roweandoon, and appears to have possessed at least a part of a country. But it soon passed under the dominion of the Moguls (1258), and finally (1858) was conquered by Timur. After the establishment of the Sfootine dynasty (1652), 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 Shakspere. Three plays of his are extant—'

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K Douglas
LABEO, QUINTUS ANTIUS, a Roman of some distinction, who was the father of an illustrious son. He was at the battle of Philippi, on the side of M. Brutus and Cassius, and after the defeat he killed himself in his tent, and was buried there. (Appian, Civil Wars, iv. 158.) He was a man of great learning, as C. Tacitus testifies; 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, Octavius Caesar, c. 54), to whose measures he set himself in opposition. Some critics suppose that he is alluded to by Horace (1 Sat. 3. 82); but there might be other persons of the name of Labeo. Aetius 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 prætorship. (Tacitus, Annal. iii. 78.)

The character of Labeo is given by Gallus (xiii. 10): "Labeo Antius principally applied himself to the study of the civil law, and publicly gave his opinions to those who consulted him. He was also not unacquainted with other liberal pursuits, and he deeply studied grammar, dialectic, and antient learning; he was also well acquainted with other things which are considered of less worth. He cultivated and availed 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 man of courage, and it was 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, and on the laws of the Curtius, and written De Disciplina Etrusca. His works which are mentioned in the Digest are, eight books of Institutes, of which Paulus made an epitome with notes; and ten books of Posteriora, so called from having been published after his death, of which Juvencus made an epitome; but Gallus refers to the fourth book of Posteriora. He also wrote Libri ad Edictum, Libri Prætoris Urbanis, and three Libri Prætoris Peregrini.

A brief notice of C. Aetius 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 attained the rank of prætor; his grandfather was a centurion who served under L. Cornelius Sulla. Capito was made Consul Suffectus by Augustus a.v.C. 758, and it was during his term of office that he decided that a patron and client had to take his freedwoman to wife against her consent, a decision perfectly consistent with Roman principle. Capito was a flatterer; Labeo was an independent man and said what he thought. Instances of Capito's adulation are recorded by Tacitus (Annal. iii. 70) and Suetonius. He died in the time of Tiberius, a.d. 52. (Annal. iii. 75.)

Capito is often cited by other jurists, Proculus, Juvenculus, Paulus, and once by Labeo: they all call him Ateles. Capito's reputation as a lawyer was very great. He wrote on Pontificial Law at least five books, as appears from Gallus (iv. 6), and numerous books of Conjectures (Gallus, xx. 2; xiv. 7). He also wrote a single book De Officio Senatorii, from which Gallus gives an extract (iv. 10), and a book De Jure Sacrificiorum (Macrobius, Saturn. iii. 10). Gallus (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 Proculus. (L. 82.) In each of the sects of 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 shewn to be in this way a more considerable orator than his pupils of the opposite sect; 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, improves jurisprudence, as it were; 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 as they do, and is 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 (response) 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 Proculiani, from Proculus, one of the successors of Labeo. Those who attached themselves to the school of Capito were called Sabiniiani, or sometimes Schola Cassiana, from Massarius Sabinius and C. Cassius Longinus. For further remarks on the subject of the two schools the reader may consult Puchtia, Carusa der Inst., i. 98.

LABIATÆ. (Lamelle, P. C.)

LABIDUS, (Matulides, P. C.)

LAPHTHINODYNUM, or Ponticush, an evergreen shrub or tree from the new red-sandstone stra. (Owen) (Salamandrioides, P. C.)

LACE-BARK-TREE. (Daphne, P. C.)

LACTICUM. (Lotus, P. C.)

LACTUCA, a genus of plants belonging to the natural order Composite, the suborder Liguliflorae, the tribe Cichorieae, and the subtribe Lactuceae of De Candolle. It has a cylindrical involucre with the scales membranous 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. roeras, Acrid L. has leaves with a prickly keel, horizontal, oblong, serrulate and clasping, maroon, dentate or sinuate, the back white, equalling the fruit, which is black. This plant is found on hedges, old walls, and the skirts of fields through the greater part of Europe, and in milky juice, which when procured and dried it has the name Lactuca Scorzonera. (Lactuca Scorzonera. P. C.) This substance is also procured from the garden lettuce (L. sativa), and in the London Pharmacopoeia the L. sativa is the only plant recognized 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 lactuca on a large scale, it appears that the Lactuca Scorzonera yields a much larger quantity, and that the produce is of a superior quality. Nor is there any reason for deeming 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 Schultz 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 65 grains. — Mr. Duncan has been enabled to procure the same with the milking 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 proportion of the period of the time of flowering. It 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 use as a salad, see
Lettuce. This plant appears to have been cultivated amongst the Greeks, and also used in medicine. It is the *Lactuca* of Dioscorides, ii. 165, also of Theophrastus. Several varieties of the garden-lettuce were used both among the Greeks and Romans as salads.

*L. scariola.* Prickly Lettuce, has the leaves with a prickly keel, pale yellow, short-stalked, and clothed from the summit, the white base, 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 5 feet high, and panicles. Its juice is not so acid as that of *L. eruca*, but possesses the same properties. It is found on the higher hills of Greece, and is probably the *Lactuca* of Dioscorides. The *Lactuca* of Theophrastus, L., and of Galen, l. ii., according to Fras is the *Lactuca* of Schulz.

There are two other British species of lettuce: *L. salignus*, with a white elongated leaf, twice as long as the fruit, the upper leaves entire, acuminate, and *L. scariola*, with the leaf much shorter than the fruit. [On the Cultivation of the Lettuce, see LETTUCE, F. C.]

(Babington, Manual of British Botany; Fras, Synopsis Plantarum Flora Classica; Christian, Dispensatory.)

LADING, BILL OF. [BILL OF LADING, P. C.]

LAGENAR'IA (from 'lagen,' a bottle), a genus of plants belonging to the natural order Cucurbitaceae. The flowers and fruits have the usual characteristics of the order, and are solitary, with subulate segments shorter than the tube. The corolla is white, with obtuse petals spreading below the edge of the calyx. It has five triangular stamens, the fifth one distinct; three sub陆续, oblong compressed seeds tumid at the margin, 2-lobed at the apex.

*L. vulgaris,* common Bottle-Gourd, is a mucous-scented plant, and clothed with a soft down. It has a climbing stem with tendrils, by which it clings to the objects with its leaves. In its wild state the fruit is poisonous, and Dr. Boyle 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 pâtés: it is bitter and purgative, and may be used instead of colocynth. This species grows wild in Egypt, Abyssinia and Arabia, where it is called Charrah; 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 in great veneration by the Hindus in their religious ceremonies.

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

LAGETTA. [DAPPEX, P. C.]

LAGURUS (from *Lyc'us,* a hare, and *eped,* a tail), a genus of plants belonging to the natural order Gramineae. It has a spiked lanceolate flowered, scarious glumes ending in a long fringed seta. The outer pale enlonged in two long setae and with a dorsal geniculately twisted base.

*L. oovata* is the only species, and has a stem from four to twelve inches in height. The leaves are broad and lanceolate, the spikes ovate and subscapes. It is found in sandy places in Germany and on the Continent of Europe.

(Babington, Manual of British Botany; Koch, Flora Germanica.)

LAING, 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 'Speculative Society,' an association in which he was joined even after he had produced a book. He was admitted at the age of nineteen to the degree of a master of arts, and in the following year was made a doctor of philosophy. He was a fellow of the Royal Society, and president of the Physico-Medical Society of Baile, to whose 'Acts' he afterwards contributed several memoirs on mathematical and physical subjects.

In 1758 Lambert 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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Masmier; by the former of whom he was afterwards recommended to the King of Prussia, Frederick III. He quitted the family of Count Sali in 1769, and, having been chosen a member of the Electoral Academy of Bavaria, he went to reside there. In 1772, he was made a member of the Commission of setting the boundaries between the territories of the Valais and the duchy of Milan; and in the following year, in consequence of an invitation from the King of France, he removed to France and spent 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 Superintendant of a commission of superintending the improvements of the kingdom.

While in Holland, Lambert published, at the Hague, a treat, entitled 'Les Propriétés de la Route de la Lumière,' 8vo. (1765), in which he examines the path of a ray of light refracted in the atmosphere, and points out some corruptions which should be made, on account of refraction, in determining the heights of mountains; and in the following year he published at Zürich one which was designated 'Frage Perspektive.' But one of the most important of Lambert's works is his 'Phenomena,' 8vo, de Mensura et Gradibus Luminis, Colorum, et Umbrae, with tables and engravings, published at Augsburg in 1760. In this treatise the author states, from his own experiments, the quantities of light reflected from the exterior and interior surfaces of glass, and he gives formulæ for representing them. He considers also the effect produced on finite objects with that of the body which enlightens them; and he discusses the brightness of the image formed by a luminous body, a great deal in this last connexion being made, to calculate the degrees of illumination on the different planets; and he describes instruments for measuring the intensities of differently coloured light.

In 1761 he published at Augsburg a valuable work entitled 'Insigniores Orbitas Comotorum Proprietates,' 8vo., in which he formulates a formula for determining, in a parabolic orbit, the perihelion distance in terms of two radii vectors and the difference of the squares of them. In the 'De Hierarchia,' 4to, published at Augsburg in 1760, he points out the absurdity of these corruptions of finite objects with that of the body which enlightens them; and he discusses the brightness of the image formed by a luminous body, a great deal in this last connexion being made, to calculate the degrees of illumination on the different planets; and he describes instruments for measuring the intensities of differently coloured light.

In 1764 was published, at Leipzig, in 2 vols. 8vo., Lambert's philosophical work entitled 'Neues Organon.' This is different from his 'Phenomena'; the former is a treatise on the same subject, but more on the political side, and a system of rules for determining the policy of a country, which is intended to be a guide to the statesman. The second volume contains a political treatise on the subject of the system of a country with respect to its civil institutions, and the third is a treatise on the character of the political system of a country with respect to its constitutional institutions, the fourth is a treatise on the science 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.; and it is entitled Architektonik, and treaties of the metaphysics of mathematics; the subjects being Unity, Number, Dimensions, Continuity, Limitis, and Infinity.

The first mathematical work which Lambert published after he went to reside at Berlin was his 'Beyträge zum Gehruchte der Mathematik und deren Anwendung' (3 vols. 8vo., 1768 to 1772). The author, giving an outline of the history of mathematics, discusses the theory of numbers, and a tract on trigonometry, with notices on what is called tetragoniometry; in it are given also some remarkable propositions relating to the projections of the sphere. In the first of these propositions he introduces the inscription of a Table Écliptique formant au Tableau vrai de toutes les Éclipses, tant de la Lune que de la Terre; and in 1770 appeared his 'Propriétés de la Terre sur diverses Eclipses terrestres Tabellen,' 8vo. He was joined with Bode, Schulze, and Lagrange in the publication (1776), under the direction of the Academy of Berlin, of a 'Série de Astronomical Tables.'

Lambert also wrote a tract on 'Hygrometry,' which was published at Augsburg in 1770; and he left one on Pyrometry, which was published at Berlin, in 1779, that is after his death; this last contains a biography of the author, by Everhard. Besides these works Lambert wrote numerous papers on scientific subjects, which were published in the 'Acta Helvetin' and in the 'Mémoires' of the Academy of Berlin. Among the 'Acta' are his 'Tentamen de Vi Caloris ejusque Magnitudine,' 1762, and his 'Dimensio' of the Earth, 1767, which was afterwards published by Lagrange, and in the 'Mémoire sur les Mouvements des Eclipses de la Lune.' Among the 'Mémoires' of the Academy contain his papers on the Incommensurability of the Circumference of a Circle to its Diameter, and the Dimensions of the Earth; one was published, 1771, by the author, and which was afterwards generalised by Lagrange, and a 'Mémoire sur les Vibrateurs' by Lagrange.

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.)
LAN, a genus of plants belonging to the natural order Labiatae. It has a 2-lipped corolla, the upper lip rounded, lower lip trilobed. The lateral lobes minute, tooth-like, or obsolete, rarely elongated. The anthers approach in pairs, and the filaments are stout and long. The calyx is 5-toothed and hallow, the teeth nearly equal. This genus includes the dead, blind, and dumb nettles of our peasants, so called from their resemblance to the Urtica in many points, except their sting.

L. amplexicaule has roundish corollate obtuse leaves, the lower ones stalked, the upper ones sessile and clasping; the teeth of the calyx are longer than the tube at length conic, the lateral lobes of the lower lip of the corolla toothless; the nuts small, and of an obvolute oblong shape. It is found in sandy and chalky fields in Great Britain, the North of Africa, and Middle Asia.

L. lasianum, the leaves reniform, corollate, 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 long as those of the oblong species, and is of an oblong shape. This species is common in Scotland, Sweden, and the North of Germany.

L. purpureum has a pale purplish 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 now so employed.

L. viscosum 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. elatum 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 lateral lobes of the lower lip having 2 teeth. The flowers oblong, and about twice as broad as long. 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 native of Greece in waste places, and is supposed by Fraas to be the Asteris herb of Dioscorides, 3. 103.

L. segetum is another 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.


LAMP. [Lights, Artificial, P. C. S.]

LANCASTER, COUNTY PALATINE OF. [Palatinate Counties, P. C.]

LAND TAX. [Taxation, P. C.]

LANDLORD AND TENANT. [Tenant and Landlord, P. C.]

LANE, GERRARD, D.D., born in Westmoreland about 1608, was successively a servant, scholar, and fellow, of Queen's College, Oxford; and he held the place of keeper of archives to the university and provost of his college for 20 years. He died at Oxford during the summer of 1668. He was a studious and timid man, who contrived to steer through the political storms of his time without giving serious offence to any party. He edited Longinus, and published several pamphlets on church questions. But his chief usefulness was in his unprinted collections, which included several catalogues of manuscripts, often referred to by Warbey and others.

LANDEBAIE, 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 dying, he was employed in soliciting books, and, in 1691, was admitted master of arts in the University of Cambridge. He bore himself however to idleness and low extravagance, and spent a great part of his property; but after a time he reformed, and retained of his earlier tastes none but his love for the theatre. 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 Kirkman, a bookseller of London, in 1690, and, secondly, in those of unprintcd, '1687, 4to. This work, specially sold off, was improved in 'A New Catalogue of English Plays,' 1688, 4to. Still further additions and amendments produced his 'Account of the English Dramatick Poets,' 1691, 8vo., 1699 (by Gilson), 1719 (by Giles Jacob, for Curi). The criticism contained in this work is shallow, prejudiced, and obsequious. The author pronounces Sir Robert Howard to be an admirable poet, and prefers Shaddwell'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 earlier attempts at a complete account of our national drama. In the British Museum is a copy of it with valuable notes by Oldys. He published also an appendix to a catalogue ofgraduates.

LANDELAIN, ROBERT. [Longland, Robert, P. C.]

LANGDONIA. [Rhiania, P. C. S.]

LANIERE, NICOLAS, a painter, engraver, and musician, who was a favourite with Charles I. He was born in 1568, and was an Italian by birth. Lanier, says Wood, 'understood hands,' by which he means that he was well versed in the handling of various masters, and was a fit person to employ in the purchase of pictures, and for whose purpose Charles frequently employed him. Wood states that he was employed in the purchase of the gallery of the Duke of Mantua, for which Charles gave 20,000l.—it comprised the Triumph of Caesar, by Mantegna. [Hampton Court Pic-
tures Gallery, P. C. S.]

Lanier was a better musician than a painter. He was appointed in 1626 Charles's chapel-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 Lanier both painted the scenes and composed the music. He also designed a mask to music, which was written by Thomas Fierro for the funeral dirge of Charles I.

Lanier lived to see the dispersion of the collection which he himself had been mainly instrumental in forming. He purchased a part of Queen's Colleges at the same time the palace in 200l. : others were purchased by his brothers Jerome and Clement. Lanier appears to have been a general dealer in pictures, and, according to Sanderson (Graphic, p. 16), to have been a very serviceable, but at the same time scrupulous, for that very reason. He had a large number of passing copies as originals: the colours were obscured by soot, and he cracked the pictures by rolling them up face upwards. He purchased many pictures for Charles, and marked them with a rosette or a small figure resembling six radiating leaves—the mark is given by Walpole. Walpole buries Lanier on November 4, 1646, overlooking the somewhat glaring inconsistency of making him write the music to Charles's funeral dirge three years after his own burial: the date is not a misprint, because: Walpole adds his age—seventy-eight years; still it ought probably to be 1649 or 1656. The date of Lanier's birth (1668) is correct, because, in an engraving dated 1656 he writes himself at the juvenile age of sixty-eight—"av la eta sua giovane di sessanta-otti anni." Vandyck painted Lanier's portrait during his first visit to England, and it was this picture which induced Charles I. to request Sir Kenelm Digby to invite Vandyck back again after his departure. There is a portrait of Lanier by himself in the Music School at Oxford, with palette and brushes in his hands, and some music-notes on a piece of paper.

(Lanier, A. de. Leopold Dorn, Oberland Conisier, &c.; Walpole, Anecdotes of Painting, &c.)

LANKESTER, JOSEPH. [School, Primary, P. C.]

LANNES, JEAN, Duke of Montebello and Marshal of France, born 21st May, 1522, at Lebaucq, in Normandy. On 28th March, 1572, he captured Dunkirk; and, on 22nd June, 1574, he received the command of the fleet which captured Vlissingh. He was created Duke of Montebello, 1576; the title of Duke of Lannion, honorary, 1578; and, in 1579, he was made a cardinal. He was afterwards killed in the battle of Parnawa; and, in 1649, a number of his letters were published in Latin, at Paris.
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pelon, the Duke of Wellington, and Marshal Ney and Soult. He was born of humble parents, and was at first brought up to the trade of a shoemaker. In 1792 he joined a battalion of volunteers raised in the department of Gers, of which he soon became sergeant-major. His first campaign was with the army employed on the frontiers of the Pyrenees, under the command of Lechervre, in which instance his bravery and decision gained him a promotion to 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 desperate attempt of the republican faction to protect the Montenotte. The attempt failed, and he was taken prisoner at the breach of the scaling-ladder, but, with the assistance of several like-minded officers, he obtained his freedom at a considerable sacrifice of his own property. His military talents were soon discovered and appreciated, and by the offers of the army he rose so rapidly in command that he was raised to the rank of demi-brigade, which nearly corresponds to that of major among the English troops. He afterwards rendered signal assistance to the capture of Toulon, and in the siege of Ciudadorgaz, which was conducted under Castaños, he was distinguished for his courage and indomitable spirit. In the battle of Aboukir, on the 1st July, 1794, he was severely wounded in the leg, but he was not kept from the service. In the affair of the Batalla de la Solana, he was engaged, and was wounded in the thigh by a ricochet shot. In the battle of the Pyrenees, he was wounded in the hand, and in the battle of Toulouse he was severely wounded in the leg. In the battle of Arcole, on the 13th November, 1796, he was struck down by a Sabre full in the face, and, though his head was cut open, yet he continued to direct the operations of the right wing of the French army. In the battle of Fleurus, on the 26th June, 1794, he was severely wounded, and his horse was killed. In the battle of Valenciennes, on the 20th November, 1794, he was severely wounded in the leg, and in the battle of Raucourt, on the 9th August, 1795, he was severely wounded in the head. In the battle of the Bicamin, on the 8th May, 1796, he was severely wounded in the leg, and in the battle of Villafria, on the 3rd May, 1797, he was severely wounded in the leg. In the battle of Rivoli, on the 14th March, 1797, he was severely wounded in the leg, and in the battle of Marengo, on the 14th June, 1799, he was severely wounded in the leg. 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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 affair of Lobau in the sanguinary battle which has been named from it, and the grand attack on the Austrian centre, which, though unsuccessful in its results, was conducted by Lannes with great skill and enterprise. The French had come up to-redoubt their battery to the island of Lobau, their wearied bands were attacked by fresh troops, which the Archduke Charles brought up in constant succession in order to dislodge them from their position. Lannes was the first to renew the attack, and, after a succession of resisting the check, posted three of his soldiers on whom he could place most reliance in the rear of the columns, and supporting them with the troops which the emperor had sent to his assistance, seconded by Masséna, he 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 deadly struggle.

At that critical moment Lannes had dismounted from his horse, that he might be less 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 representations of it are prodigious probability and exaggeration.

The description given by T. Illion, who, it is chiefly derived from the accurate narratives of Pelet, Savary, and Thibault, is that which appears most consonant with truth. At Lannes approached the litter that contained the shattered remains of his hero;composition, Lannes had still sufficient strength remaining to seize his hand, and, with a voice weakened by loss of blood, to bid him last adieu.

"Live," said he, "for the sake 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, kneel and weep the conquerors of Europe. "Lannes," he exclaimed, "do you know me? It is 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 Masséna, "but so terrible a calamity could have withdrawn me from a moment for 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, stir the genuine emotions of the heart. For nine days, as had been proved, in the rapid and disheartening success 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 Bayard, it 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 giant." 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 his conduct of operations; he was ready to take advantage of any opportunity which might present itself. Violent and hasty in his temper, even in my presence, he was however ardent attached to me." His character was formed on the postures of the sovereigns of the soldiers of that period; a large sharer in the rewards which Napoleon so lavishly bestowed upon his generals, he was as prodigal of his means as of his blood. But to his credit it may be added that, a conquering officer, cause went to the relief and support of his poorer companions in arms.

Lannes had married Mademoiselle Louise de Grèhémec, a young and elegant beauty possessed of a delightful voice. When she became a widow, Napoleon evinced by the most assiduous attention to her the high respect he bore for the memory of her distinguished husband. She was afterwards appointed a lady of honour to the Empress Marie Louise. The present Duke of Montebello, Lannes' eldest son, has married an English lady, Ellen, the daughter of Charles Jenkinson, Esq.

The Military Life of Lannes, written by Mons. René Feris, was published at Paris in 1809.

(Allison, Hist. of Europe, vol. iii. and vii.; Las Cases, Mémorial de St. Hélène, vol. ii.; Mémoires de la Duchesse d'Abrantes; Court and Camp of Napoleon, Murray's Family History of France, 1835; Liberty and Empire, 1851; Bibliographie Universelle, etc., deuxième partie, Paris, 1829; Biographie Moderne, Paris, 1815; Napier, Hist. of the Peninsula War.)

LANZAROTE, [SKYLIGHT, P. C. C.]

LANTERN, MAGIC. [MAGIC LANTERN, P. C. S.]

LANZAROTE, one of the Canaries, lies about seventy miles from Cape Juby on the western coast of Africa, between 28° 60' and 29° 10' N. lat., and 18° 30' and 14° W. long. It is separated from the island of Fuertaventura, which lies south of it, by a strait which is from four to six miles wide, and is called La Boyana. 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 Alegranza and Graciosa, which are inhabited, and produce pears and orchillas; the others are only rocks. The strait which separates Graciosa from Lanzarote is seven miles broad, and it is in most places, than six miles 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 in a continuo succession of basaltic cliffs almost perpendicular to the height of 1400 feet. The upper part of these cliffs belong contains an extinct volcano, called La Corona, whose edges rise to the elevation of 1588 feet above the sea. From this point the rocky mass descends southward, and is surrounded 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 Guanapé, the capital of the island, of this place the country is covered by numerous hills surrounded by fields of fava. 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 1730. 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 extreme, with the exception of a very small bay called Jambilo, where was 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 barren as the western, and being surrounded by an island, called Montana Blanca, lies to the east 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 centre of their island is exceedingly hilly, but during certain seasons, when the south-eastern 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 it is very dry and arid.

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 Madeira. The principal industry of the island, as productivity, is the production of the lassara, which is obtained from the Mesembryanthemum crystallinum: this plant is indigenous, but has also become the object of extensive cultivation. In several places on the island there is a very small; they are only kept for agricruitural labour. Very few horses and mules are kept; but there are many dromedaries and asses. There are many goats and sheep. There are few hogs. Of fruits they have large fig-trees and pomegranates. They also grow vineyards. A considerable quantity is exported to the other Canaries.

The population is estimated at about 18,000 individuals. They are strong built, and of a dark complexion. Many have
black curly hair, and some features which prove that the ancient Spanish settlers have intermarried with the Moors and negroes. 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 fishing-ground extends from the Bay of 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 bream, and salt them. Salt-fish constitutes the principal food of the population.

The capital is Teguise, a small place consisting of about two hundred houses scattered over a small hill. On the eastern shore is the harbour, called Puerto del Rosario, a natural and secure harbour, formed by two rocky islets; it is about two miles long and one broad. The northern has a depth of twelve feet, and the eastern of a fifteen and a half at low-water, with a nine-feet rise of tide. The town of Arrecife is situated immediately to the southward of the port. It has several large houses and spacious streets. The population is 2500.

No foreign goods are allowed to be imported. The island receives them from Tenerife and Grand Canary. But English and American vessels resort to Puerto del Rosario to export barrils and orchillas. The exportation of the first-named article amounts annually to 3500 tons, and that of orchillas to two or three hundred barrels. The exportation of foreign vessels visiting annually the island is stated to vary between twenty-five and thirty. Lanzarote exports to Tenerife and Palma considerable quantities of grain, bran for the West India market, salt, fish, and salted brandy. The Dromedaries, imported from Corisco, are chiefly used for 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 distributed, ship, and cattle are received in return.

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 1730, and the great dearth in 1768 to 1771, prevented the inhabitants from improving their agricultural condition. But in the middle of the eighteenth century the cultivation of the barrilla plant was introduced, and since that time the condition of the population has improved.


LAPO, 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 been born in 1294, and to have been the pupil of Arnolfo of Siena, and was sometimes called in Florence Jacopo Tedesco, but more frequently Lapo. This Lapo, who executed many works in Florence, died there, according to Vasari, in 1322.

The names of Arnolfo di Lapo and Lapo were not otherwise connected further than that they were contemporaries in Florence. Arnolfo was the son of Cambio, a native of Colle, and, according to Vasari, was born in 1292. Arnolfo did for building, says Vasari, what Cimabue did for painting: he was the pupil of Cimabue in design. He was the greatest architect of his time in Florence, and was the architect of many important works. The walls of Florence, which were erected in 1284, were planned by Arnolfo. He built the hall of Or San Michele, the old corn-market; the loggia and piazza de' Priori; and in 1294 he laid the foundations and built the great church of Santa Croce, now called the Chapel of St. Mary of the Cross, and the great monument of the Medici. But his greatest work is the church of Santa Maria del Fiore, or the Cathedral of Florence, of which he laid the foundations in 1298, or, according to some accounts, in 1294. He relieved the walls of the whole church, and covered part of it in, but the vast dome is the addition of Brunelleschi; it stands however on the foundations of Arnolfo, who also, according to his model, had intended to erect a dome in the shape of a perfectly conical one, with a lower angle than the enormous pile of Brunelleschi, which is one of the largest domes in the world, and but little less than the gigantic vault of St. Peter's, which is an imitation of it. [Dome, P. C.]

The church is in a complete state of preservation. The pulpit is of porphyry, and the work of Arnolfo. For the erection of this immense church, a tax of two sous per head was levied annually upon the citizens of Florence, and they were encouraged by indulgences to make donations to its building-fund. The external marble facing of the wall is the work of Arnolfo. The old municipal palace, the Palazzo della Signoria, which still exists as a part of the old palace of the Five Minor Princes, in the Piazza della Signoria, was also built by Arnolfo. And there are works by him in other Italian cities: he executed in 1285 the marble tabernacle of the Basilica of San Paolo, without the walls, at Rome; and shortly before 1300 he designed and executed the monument of the Cardinal de Braye in the church of San Donnino at Orretto.

Arnolfo died, according to Vasari, in 1300, aged therefrom sixty-eight, and not sixty-four, as says, if the year of his birth as given by Vasari himself be correct. Arnolfo's portrait by Giotto is in the picture of the death of San Francesco, in the church of San Croce at Florence: it is one of the group of figures conversing together in the foreground.

(Vasari, "Vite de' Pintori, &c.; Richa, "Delle Classi di Ficenze; Rumohr, "Italienische Forschungen.")

LAPP, a genus of plants belonging to the natural order Composite, the sub-order Tubuliflorae, the tribe Eremosporideae, and the sub-tribe Carrionae. It has an equal and many-flowered homogamous head, a globose involucre, with imbricated coriaceous scales. The receptacle is rather fleshy, flat, and with stamens and florets in two rows. The corollas are 5-lobed, regular, and with a 10-nerve tube. The stamens have papilliform filaments, with anthers terminating in filiform appendages. The fruit is oblong, laterally compressed, smooth, and transversely wrinkled.

L. minor has a tapering fleshy root, an erect stem, 3 feet or more in height, solid, leafy, round, and with many wide-spreading branches. The leaves are stalked, broad, heart-shaped, and being 3-ribbed at the base, somewhat hairy and downy beneath. The florets 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 flor. It is an admirable herb for making and dressing the hair and clothing of those who pass by, and it is almost impossible to become free from it without breaking the scales asunder and scattering the fruit. The root is reckoned tonic, appetizing, and diuretic. It has had some hold as a remedy in rheumatism and diseases of the skin. Sir Robert Walpole recommends it as a remedy in gout, and some have used it as an excellent substitute for asparagus. 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. senor and L. tenentia are species which are found in Germany and Switzerland, but not used in the arts or in medicine.

(Lindley, "Flora Medica; Koch, "Synopsis Flora Germannica.")

LAP'SANA, a genus of plants belonging to the natural order Composite, the sub-order Liliiflorae, the tribe Acanthaceae, and the sub-tribe Lampsane. There is but one British species of this genus—

L. commutata, an annual herb. It has scutate or lobed stalked leaves, the lower leaves lanceolate; the involucres glabrous and angular; the stem panicked. The stem is from one to three feet in height, branched above, with yellow 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 abrasions.

L. fistula is a species of this genus, which grows in Switzerland and the regions of the Alps.

(Waddington, "Manual of British Botany; Koch, "Synopsis Flora Germanica.")

LAPSE. [BRENNICE, P. C.]

LARZIBIAULA, a genus of plants belonging to the natural order Malvaceae, and the tribe Mimosaceae, after Michael Lardizabal, of Urbe, a Spanish naturalist. It has dacieous or polycymous flowers. The sepals and petals disposed in a ternary order in 2 or 3 series. The stamens 6, monadelphous, and scaled, 3- or 6-foled, the anthers bithecous. The pulp of the fruit sweet and edible. It has leaves 2-5 ternate; the leaflets obtuse, acute, unequal at the base, a little toothed; two large uncorally carinate bony hairs situated at the base: the wood a pale reddish. This plant is inUNK about Anasco. It has a native Chili of woods at Concepcion, also in Peru about Arimo. It has an edible fruit, which is gathered and

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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-bougni and Guibougni; and by the baron, L. Larrey, L. trifolii and L. trifolii are climbing plants, natives of Chili and Peru, but their fruits are not eaten.

(L'Anpr 1821. Dictionnaire de Larrey) LARREY, DOMINIQUE-JEAN, BARON, was born at Beauce, near Bagnères de Bigorre, in France, in July, 1786. He studied the elements of medicine and surgery at the hospital of Toulouse, under the direction of his uncle, the baron, L. Larrey, who practised medicine in that city. In 1787 he went to study his profession in Paris, and obtained the appointment of surgeon to the frigiate Vigilante, in which he visited North America. Grandfathered to Paris at the commencement of the Revolution, and in 1792 joined the French army which was then carrying on its operations on the Rhine. Here he distinguished himself by the invention of the ambulances volantes, by means of which the wounded, being first dressed, were carried off the field of battle, even under the fire of batteries. He was at the siege of Toulon, where he became acquainted with Napoleon Bonaparte, who was then a lieutenant of artillery. In 1796 he was appointed professor in the school of medicine and military surgery at Val de Grace. In 1798 he accompanied the French army with Napoleon to Egypt, and on his return published an historical and surgical memoir of the campaign. [Rela- surgie de l'Expedition de l'Armee d'Orient et en Syrie, ed., Paris, 1803. From this time he was ad- vanced to various honourable positions; after the battle of Wagram, in 1809, he was appointed a Baron of the Empire; in 1812 he was made surgeon-in-chief of the imperial army. He helped, says Mr. Arrott, in the Hibernian edition for 1841, to be published under the title of Nautical which he had earned, was that of a childish vanity; for he knew that neither the chance of birth nor the favour of a court had made him a baron, but that the dignity had been bestowed by a discriminating hand which never conferred honours upon incompetence or ineffi- ciency.

An anecdote is related of Larrey which shows his courage, and proves that he did not obtain the good graces of the Em- peror by any mechanism of character. After the battle of Wagram and Wurtzberg it was suggested to Bonaparte that the number of the wounded had been increased by voluntary nut- tation. He immediately ordered that the suspected, to the number of 280, should be separated from the rest to be ex- amined by the surgeons, and if found guilty they should be shot. Nobody doubted the guilt of the parties, and great anxiety was shown to put the sentence into execution, when Larrey demanded time to examine the suspected persons accu- rately, and to learn what still should be known. He addressed a report to Napoleon, expecting that his dismissal would follow. The contrary was the case, for Napoleon wrote a letter in return to the number of 6000 francs, and the warrant of a pension of 5000 to be paid from his own private purse. Napoleon bequeathed to Larrey at his death 10,000 francs, at the same time expressing his convic- tion that "Larrey was the most virtuous man he had ever known."

Larrey published many works besides that above referred to, which contain a great mass of valuable surgical observations. One of his earliest publications was his 'Dissertation sur les Amputations des Membres a la suite des coups de feu, et de diverses operations," Paris, 1790. In this work he demonstrated the necessity of immediate amputation after gun-shot wounds, and clearly pointed out the cases in which it was indicated. The propriety of such a practice had been previously suggested, but it is to Larrey that we are indebted for carrying it largely into effect. It was at one time the prac- tice of surgeons in cases of mortification after a wound, prevailing to performing amputation, for the line of demarcation to form between the diseased and sound parts. Larrey proved that in cases of gun-shot wounds, the best practice consisted in operating immediately after the reception of the wound.

In addition to these works he published 'Memoires de Chirurgie militaire et Campagne," ed., Paris, 1812; "Recueil de Memoires de Chirurgie," ed., Paris, 1821. A multi- volume series of these and other journals of France, the Bulletins of the Academy of Paris, and other volumes, on almost every department of surgery, bear testimony to his industry and talent, and the enlightened principles on which he was based the practice of his profession. Some of these have been translated into most of the languages of Europe, and have obtained for Larrey a first position among modern surgeons. He died at Lyon, on the 25th of July, 1841.

(London Medical Gazette, 1841; Kallisen, Medicinales Schriften—Leiden; Lancet, 1841.) LASERPIETUM (the name of the ancient Silphium), a genus of plants belonging to the natural order Umbelliferae. It has a calyx with a 5-toothed rim; the petals obsolete, imbricate, with 5 or 6 shorter lobes; the fruit compressed from the 4- or 5-angled, 8-winged, that is, the half-fruits with 5 primary stiff-ridged, and 4 winged secondary ones; a vitta in the channel below each secondary ridge. The species are herbaceous, plants, with 2-3-pinnate leaves, some with heart-shaped lobes; the flowers showy umbels; the involucres many-leaved; the flowers white, rarely yellow.

L. glabrum, glabrous Laserwort, has bilobed leaves, quite glabrous in every part; the leaflets obliquely coriaceous, here and there mucronate and toothed; leaves of the involucres acuminate; of the involucres acuminat; wings of the fruit equal, rather curved. This plant is a native of the mountains of Europe in 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 somewhat injurious, in the 18th century. The French call it Turbex Montagnes and Turbex Vertic.

L. Silur has bilobed quite glabrous leaves; lobe-lanceolate or oval, quite entire, mucronate, sometimes confluent, and the base of the leaves of the involucres linear-lanceolate, slightly acuminate, the wings of the fruit narrow. It is a native of the mountains of the middle and south of Europe. The root is extremely bitter, and yields an aromatic resinous substance which has been supposed to be the Silicone or Silyer of the ancients, (Silicium, P. C.; LARREY, P. C.) L. Silur is supposed by Frass to be identical with the Arctaria of Dioscorides, 3, 51. Sibthorp found this plant in Greece, "L. uniflorum," a native of Portugal and Spain, and also yields a gum-resin. One of the species of Laserpitium described, and many of them yield a gum-resin, which is one of the secretions of the order to which it belongs.

(Lindley, Flora Medicina; Don, Gardn's Dictionary; Frass, Synopsis Plantarum Flora Clasica.) LASTRICA, a genus of Fenns, belonging to the tribe Aspleni. It has a robust inflorescence attached by the sinus, the veins distinct after leaving the midrib, and not similar with those of the adjoining pinnate.

The following species of this genus are described in Bagnalls Manual of British Botany: L. Thelyphora (Marsh Fern); L. Lyriscus; L. Filsus Mas (Male Fern); L. cristata; L. rigidula; and L. dilatata. For the properties, &c. of the more important of these species see Asplenium, p. 476. LA THORIE, C. B. TURING, P. C., p. 418; Earthwork, p. C. P., p. 244; Pottery, P. C., pp. 472, 473.) LATHYRUS. [Viciae, P. C.] LAVATERRA, in honour of one of the two Lavaters, a genus of plants belonging to the natural order Malvaceae. It has numerous styles, a double calyx, the outer one being three- leafed, the inner five-leafed; the capsules orbicular and many-seeded; the cells circularly arranged, and one-seeded.

L. arborea (Tree Mallow) has a woody stem, the leaves seven-angled, plaited, and downy; the pedicels aggregative, axillary, one-flowered, and much shorter than the pedicel. It is a native of Italy, Spain, Portugal, the north of Africa, and the Canary Islands, on waste places; also in Britain, in the Isle of Wight, on Portland Island, in Cornwall, and Devon- shire. It is the Malva of Theophrastus (Hist. Pl., i, 1; 4, 8).

L. neapolitana has an herbaceous scabrous erect stem, with roundish-nerved leaves, and seven blunt crested lobes; the pedicels axillary and aggregative, the involucres shorter than the calyx lobes, and slightly calyx-like. The flowers are blue with obovate petals. This species is the native of Naples, by the sea-side, and is much cultivated in our own gardens as an ornamental plant.

L. officinalis, a shrubby plant, many-branched, 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 small, solitary, calyx-like. It is a native of Provence, in hedges about D'Ieiras.

None of the species of Lavatera are of any importance or
value, excepting as ornamental plants. Many of them are indigenous and of the most conspicuous variety. The greenbough 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 from the frost, will continue to grow throughout the year. The perennial species grow in every 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 the open border during the spring. The species chiefly worth cultivation in gardens are L. Odan, Anna, unguiculata, Nempskiana, Cretica, Luteanica, and trimestris.


LA W. CRIMINAL. The object of the English 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 which the law thinks fit to prevent by such means; in most cases it is satisfied with the redress of injuries after they have been committed, by either restoring the party injured to his rights, where that is possible, or by giving him compensation in damages. In an 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 or omission of a legal duty as subjects the person guilty of it to punishment by the authority of some sovereign or by any armed body of men, the authority whose redress only have, in England, been usually denominated civil as contradistinguished from crimes. It is to be observed however, that, in strictness, every crime includes an injury or wrong to a person, and that if every injury, or wrong to a person, be 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 circumstance 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 great classes, viz. those based 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).

2ndly. 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 proceedings 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 or divisions, viz.: 

1. Treasons, Præmunires, Felonies, and Misdemeanors. Persons who commit the offences which constitute the last-mentioned division shall be prosecuted by criminal information instead of being indicted.

The distinction between these classes is, for the most part, a merely arbitrary one, without any apparent reference to rule or privilege. Nevertheless, it is an established fact, that inquests in their 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 of crimes were marked by distinctive characteristics; but they have subsequently, by artificial constructions of the courts or by legislative enactment, been made to embrace offences of a very different nature from those originally included within them. For instance, the crime of treason, whether high or petit, implied a violation of the allegiance due from an inferior to a superior. In the case of high treason, so called by way of eminent distinction, the violation of the allegiance due from 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 ecclesiastical by his inferior who owed the faith of his order, the breach 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 created by the courts. It will be sufficient here to give a single illustration of the mode in which the law has been adapted to reach cases totally inconsistent 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 to be armed by force to redress an injury, 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 to levy war against the king. This construction is said to depend upon the generality of the design. If the intention be to call down particular inclosures or meeting-houses only, the offence is a mere riot, and in quality a simple misdemeanor. Though the generality of the design may be a reason for awarding a higher reward than 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 misdemeanor 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 term of treason. They propose that the only assemblings or meetings 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 his government or authority, or with intent to do him bodily harm, or impose any restraint upon his person, or to depossess him, or to dispossess or deprive him of any portion of his dominions or his royal authority, or to prevent him by force or violence from changing his measures or counsels, or to put any force or constraint upon or to intimidate or overawe both houses or either house of parliament; and that no assembling or rising of the people should by reason of any illegality or general 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 should be recommended as misdemeanors merely, according to the circumstances by which they are attended.

Again, the term 'Treason' 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 treason, but in some instances none at all. The Habeas Corpus Act (21 Car. II. c. 12) contains an instance of the latter meaning of the word. By the 21st section of that act it is made a Treason 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 'Præmunire' was adopted from the first word of the original writ on which the subsequent proceedings were founded: 'Præmunire (for præmuniri) facias A. B. quod sit ad rem publicam.' As a term of the common law of England, the phrase 'Præmunires' or 'Præmunire' was in the 18th century, sanctioned by the Customary Law Commissioners propose to abolish præmunires as a class of crimes.

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The crime of felony had its origin in very remote times, and was founded upon feudal principles. Its incidents were not formerly, 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 infeudation of the lord or of the tenant; and where committed by the tenant, occasioned as a consequence the forfeiture of his hold to the lord. (4 Black. Comm., p. 96; 4th and 7th Reps. of Crim. Law Commrs.)

Those crimes, therefore, which induced such forfeiture, and, by a small deviation from the original sense, those which induced the forfeiture of goods and lands, were, by the term felony, long used to the crime 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. El. St., 10) in his study of the origin of the word felony, seems to be that which is before laid down, viz. an offence which occasions a total forfeiture of either lands or goods, or both, at the common law; and to which capital or other punishment might be upheld, the crime of felony, for the violation of the law of guilt.' Where the punishment is less than capital, the offender loses his goods only; where capital, his lands as
is only, and the judge shall sentence the jury and shall stipulate for all the evidence for the crown which is admissible, and shall deliver it to the crown in the order in which it is placed in the record, and shall be bound by the same. And if a female, that the offender be drawn 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 offender, and the body be divided into four quarters, to be disposed of as is directed in the manner of the body of a male. The judgment of death in the case of treason is that the court shall proceed immediately to the execution of the sentence of death, and shall be executed by the sentence of the court, and shall be committed to the charge of the sheriff of the county, and shall be executed in the manner therein. 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, countersigned 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 the queen shall direct, and the warrant shall be sent to the sheriff of the county; and that he shall remain in prison at the king's pleasure, or, as other authorities have it, during life. These penalties were first imposed by the Statute 16 Hen. II. c. 5 (commonly called the Statute of Treason); and it is by reference to that statute that all subsequent penalties have been made punishable. It was formerly supposed that a person convicted of treason, being put out of the king's protection, might be killed with impunity, as being the king's enemy; but by the 5 Eliz. c. 1, ss. 21 and 22, it was enacted that it should not be lawful to kill any person attainted in a treason, saving such pains of death or other hurt or punishment as theretofore might, without such danger to the person accused, be inflicted upon persons apprehended. When the above penal consequences incident to the whole body of offences constituting each class will be first stated, and what in respect of those consequences differ from a capital treason. The classes will be taken in the same order as above.

1. Treason—Treasons, with one exception mentioned below, are capitulated: but whether capital or not, the offender, upon being convicted, is made liable to the crown for the punishment of:—

(a) Civil description, whether in action or possession, or settled by way of trust, which the offender has otherwise than as an executor (Civ. Cas, 568, or a trustee, or a mortgagee (4 & 5 Will. IV. c. 23, s. 3) at the time of conviction; and in the case of capital treasoms, upon attaint by judgment of death or outlawry, the blood of the offender is corrupted, but so not to obstruct descent to such offender's posterity, when such is the object of the act of wrongdoing, to a remote ancestor (5 & 4 Wm. IV. c. 106, s. 10), and all the freehold lands and tenements of inheritance in fee-simple or fee-fait, and all other hereditaments (except copyholds), which are obstructed, and which the party of right of entry on freehold lands and tenements which the offender has (otherwise than as a trustee or mortgagee, 4 & 5 Wm. IV. c. 23, s. 3) at the time of the offences committed 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 dower, are forfeited to the crown (4 & 5 W. Comm. 381). 26 Hen. VIII. c. 13, s. 5; 33 Hen. VIII. c. 20, s. 2; and 5 & 6 Edw. VI. c. 11, ss. 9 and 13); and all the copyhold estates belonging to the offender at the time of the offence committed are forfeited to the crown (3 & 4 W. IV. c. 106, s. 12, and 4 W. IV. c. 23, s. 3). All the above penal consequences are general to all capital treasons, unless, as is sometimes the case, the act which creates the particular treason expressly exempts from some of them. The nature of the punishment of a non-capital treason is the party guilty of treason is liable to those only of the above consequences which accrue upon conviction, since the others follow only upon the party's being attained, that is, sentenced to death or outlawry, which latter, in the case of 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 inadvertence. By the Forcibull Consolidation Act (11 Geo. IV. & 1 W. IV. c. 1) it was declared to be treason and punishable with death to forge the great and other royal seals and the sign manual. By the 2 & 3 Wm. IV. c. 123, the punishment of death was repeated for forgery in all but the two cases of wills and powers of attorney to trustees stock (it has been since taken away in these cases also by the 7 Wm. IV. & 1 Vict. c. 84); but the quality of the offences amounted in the Forcibull Consolidation Act was left without alteration; so that to forge the royal seals, it would appear to be still treason, though no longer a capital offence.

The judgment of death in the case of treason is that the court shall proceed immediately to the execution of the sentence of death, and shall be executed by the sentence of the court, and shall be committed to the charge of the sheriff of the county, and shall be executed in the manner therein. And if a female, that the offender be drawn to the place of execution and be there hanged by the neck until dead (54 Geo. III. c. 146, s. 2).
have been confined after conviction. (2 & 3 Will. IV. c. 75, s. 18; 4 & 5 & 6 Will. IV. c. 86.) The court however is empowered to order such a defendant 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 entered is not to have the force of one at law, but is thereupon reversed. (4 Geo. IV. c. 48, ss. 1 & 2; 6 & 7 Will. IV. c. 30, s. 2.)

4. Misdemeanors.—The punishment in the case of misdemeanors is not one specially provided by statute, is generally fine and imprisonment.

From what has been stated, it will be seen that the circumstances, so far as punishment is concerned, which distinguish offenses in their legislative arrangement and in their due process of law, are the presence or absence of forfeiture as a 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 statutable provisions; whereas in the latter, 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 capital and non-capital offenses, as regards the form of capital and non-capital felonies (the term is used here in its ordinary restricted sense) and the non-capital treason above described; but the difference between felonies and treasons when punishable with death was, that whereas the former offended by fee simple, attainer, forfeits to the crown the profits only 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 where 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 succeeding to them, owing to his blood being corrupted by the attainer; and it is on account of such estates eschatising and not being forfeited that they go to the lord of the fee (that is, subject to the crown's, year, and waste, and not to the crown, unless there appears to be an 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 attaint, 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 with the profits of the like freehold estates of the offense, but all which he may acquire at any time afterwards; and instead of forfeiting to the crown the profits of his copyholds during his life, and to the lord of the manor his copyholds on his death, he is deprived of the benefits of the tenure 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 respect of a male forfeiter. This power is now empowere (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 hardship of the law of forfeiture. The Criminal Law Commissions however recommend the entire abolition of the confiscation of property as a necessary incidental to convictions for treason or felony. (Sixth Report on Criminal Law.)

The difference between the judgment of death for treason and that for felony requires no comment.

Besides the above peculiarities of punishment, these offenses differ also in the penalties attendant upon conviction by virtue of the nature of the procedure; but it will be more convenient to refer to these when describing our general system of criminal procedure.

Having pointed out the leading characteristics of the various classes into which such 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 view the offenses belonging to each class are arranged under their several subdivisions. The order has been 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 avoiding 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, of infancy, of infancy, or decreas'd notoriety, were not capable 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 homicide by intoxication or other not a sufficient 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, inducting a well-grounded fear of death or of suffering, will excuse a person acting under such duress 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 stat. 7 Will. IV. & 1 Vict. c. 90, s. 5, it is enacted that no court shall direct any offender to be kept in solitary confinement for any longer period than three months in the space of one year. Whenever, therefore, in the following statement solitary confinement is mentioned as part of the 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 whatever, where the crime charged shall include an assault against the person, to acquit of the felony, and to find a verdict of guilt of assault against the person indicted, if the evidence shall warrant such finding; and thereupon the court may imprison the person so found guilty of an assault for any term not exceeding three years, without or with hard labour or solitary confinement, or with both.

By the stat. 1 Geo. IV. c. 57, s. 3, it is provided that where the whipping 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, the court is being restricted to make, the above provision operates.

By the stat. 3 & 4 Vict. c. 111, made perpetual by 5 & 6 Vict. c. 85, members of joint-stock or other banking companies, the leading officers of which are accused of any crimes against 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 following cases it is described only of any particular offence. It is to be observed, however, that where a crime is defined by statute, the enactment in most cases comprises, in fact, many others 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 offence. With respect to these statutes, those which define the crime, as well as those which declare the punishment, are referred to where the statutes are distinct, and these are arranged as regards any particular crime in the order of date; and generally, but not universally, where statutes of both descriptions are preferred to those which are distinct, they are so arranged that the former statute is always the first in order. The following statement contains no offence contained in any merely temporary act, or in any local or private act, of a date subsequent to the period since which those such acts have been printed separately into the public general acts.

I. TreaSon.—(Capital.)

The following treasons are punishable with death, viz.:—

1. Compassing the death of the king (which term includes a queen regnant) of the time of the king, or of his heir apparent.
violation of the king's companions, (i.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, and going or being in the realm or elsewhere, and being thereof attained 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 in their places doing their offices. 
(25 Edw. III. st. 5. c. 2.)

2. Endavouring to prevent the person next in succession to the crown, according to the Acts of Settlement, from succeeding thereto. (Anne, st. 2. c. 17. s. 1.)

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. Compeasing or intending the death or destruction, or any bodily harm tending to death or destruction, to any person wounding, imprisionment 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 overawe the parliament; or to move any foreigner to invade any of the British dominions; such compoeasing or intention being expressed by publishing some printing or writing, or by some overt act contrary to 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 14 years of age: (Anne, c. 6. s. 1.)

6. Knowing 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 and writing in use any such bulls, writings or instruments. 
(18 Eliz. c. 2. ss. 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.

Treason.—(Non-Capital.)

The following treason (the one already alluded to) is punishable with transportation for life or not less than seven years, or with imprisonment for any term not exceeding seven years, or with and without hard labour or solitary confinement, or with both, viz. :

1. Forgery of the great seal, her majesty's privy seal, or any part thereof; or defacing, mutilating, the royal seal, or any copy or impression thereof, the seal being 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. Deans and chapters omitting to elect a bishop; and archbishops or bishops to consecrate the person so elected after receiving the queen's congé d'elire. 
(25 Hen. VIII. c. 20. s. 7; repealed by 1 & 2 Philip and Mary, c. 8, and revived by 1 Eliz. c. 7.)

3. Making the assizes of abbey lands contrary to the provisions of 1 & 2 Philip and Mary, c. 8. 
(1 & 2 Phil. and Mary, c. 8. s. 40.)

4. Obtaining any stay of proceedings, other than by arrest of judgment or writ of error, in suits for monopolies. 
(21 Jac. I. c. 5. s. 4.)

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. II. c. 24. s. 14.)

6. Attempting maliciously and advisedly, by speaking or writing, that both Houses or either House of Parliament has a legislative authority without the crown. 
(13 Car. II. c. 1. s. 3.)

7. Sending any subject of the realm a prisoner beyond the seas in defiance of the Habene Corps Act. 
(31 Car. II. c. 2. s. 12.)

8. Asserting, maliciously and directly, by preaching, teaching or advising speaking, that any person, other than according to the Acts of Settlement and Union, has any right to the throne of these kingdoms, or that the crown and parliament cannot make laws to limit the descent of the crown. 
(6 Anne, c. 11. s. 1.)

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. 
(18 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, custom houses, castles, forts or other naval establishments, 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. Attempting to murder the king, or to destroy the government, or to commit any other treason against the crown. 
(16 Geo. III. & 1 Wm. IV. c. 16. s. 2.)

5. Robbery, aggravated by wounding the person robbed. 
(7 Wm. IV. & 1 Vict. c. 87. s. 2.)

6. Piracy, aggravated by endangering the life of any person on board any vessel in the realm, in respect of which the piracy is committed. 
(7 Wm. IV. & 1 Vict. c. 88. s. 4.)

7. Setting fire to a dwelling-house, any person being therein. 
(7 Wm. IV. & 1 Vict. c. 89. s. 4.)

8. Destroying vessels with intent to murder, or whereby human life is endangered. 
(7 Wm. IV. & 1 Vict. c. 89. s. 4.)

9. 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.)

10. Besides the above offences, that of willfully and without lawful authority taking, carrying off or stealing any sort of goods, wares or merchandise, or any other thing 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 55 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 and 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 inadvertence (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 55 Geo. III. c. 185. s. 7) is still left capital.

There are two other enactments of capital offences, which also do not appear to have been repealed. The 2 Geo. II. c. 25. s. 2, and the 12 Geo. III. c. 48. s. 1, make it capital for offenders convicted under the provisions of those statutes, to escape or break out of prison; and these enactments 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-break by penalties not capital, yet these seem to be confined to particular goals 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
  I. Transportation for life, and previously thereto imprisonment
  or without hard labour, for any term not exceeding
  four years.
  1. Offenders transported from Great Britain being found at
  large, unless some lawful excuse, before the expiration of
  their term of transportation. (2 Geo. IV. c. 84, s. 39; &c.
  & 5 Wm. IV. c. 67.)
  II. Transportation for life.
  1. Rape. (9 Geo. IV. c. 31, s. 16; & 4 & 5 Vict. c. 56, s. 3.)
  2. Carnally knowing and abusing girls under ten years of
  age. (9 Geo. IV. c. 31, s. 17; & 4 & 5 Vict. c. 56, s. 3.)
  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 Hmn. VIII. c. 15; 11 & 12 Wm. III. c. 7,
  s. 8, & 10; 4 Geo. I. c. 11, s. 7; 6 Geo. I. c. 10; 8
  Geo. I. c. 54, ss. 1 & 3; 2 Geo. II. c. 26, s. 7; 18 Geo.
  II. c. 48, s. 3.)
  2. Offences against the Riot Act.* (1 Geo. I. st. 2, c. 5,
  ss. 1 & 5; 7 Wm. IV. & 1 Vict. c. 91, ss. 1 & 2.)
  3. Resucing a murderer out of prison, or whilst going to or
  from such execution. (Geo. II. c. 97, s. 7; 7 Wm. IV. & 1
  Vict. c. 91, ss. 1 & 2.)
  4. Seducing sailors or soldiers from their allegiance, or
  trust to them mutiny. (37 Geo. III. c. 70, s. 1; & 57 Geo.
  III. c. 73, s. 1; 2 Geo. IV. c. 56, ss. 1 & 2.)
  5. Administering oaths binding any person to commit
  treason or any capital felony. (29 Geo. III. c. 104, s. 1; &
  7 Wm. IV. & 1 Vict. c. 91, ss. 1 & 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, being away &c.
  persons to make slaves of them. (2 Geo. IV. c. 113, s. 9; 3
  & 4 Wm. IV. c. 73; 7 Wm. IV. & 1 Vict. c. 91, ss. 1 & 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 & 2; 8 & 9 Vict. c. 87, s. 63.)
  8. Shooting at vessels belonging to the navy or in the
  revenue service, within 100 leagues of the coast; or shooting at
  rear-ends tugs and prizes employed for the prevention of
  smuggling. (7 Wm. IV. & 1 Vict. c. 91, ss. 1 & 2; 8 & 9
  Vict. c. 87, s. 64.)
  9. Attempts to hinder, by attempting to administer poison,
  or shooting at or attempting to drown, strangle, or strike
  any person, although no bodily injury be effected. (7
  Wm. IV. & 1 Vict. c. 85, ss. 3 & 8.)
  10. Shooting at or 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 & 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 & 9.)
  12. Attempting to procure the miscarriage of women. (7
  Wm. IV. & 1 Vict. c. 85, ss. 6 & 8.)
  13. Robbery, aggravated by the offender being armed, by
  means of, or by the use of personal violence to the person
  robbed. (7 Wm. IV. & 1 Vict. c. 87, ss. 3 & 10.)
  14. Extorting property by threatening to accuse
  whereof any money or other property. (7 Wm. IV. & 1
  Vict. c. 87, ss. 4. & 8.)
  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. 4 & 8.)
  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, partner or underwriter. (7
  Wm. IV. & 1 Vict. c. 89, ss. 6 & 12.)
  17. Forcibly preventing a person endeavouring to save his
  life from a vessel in distress or wrecked. (7 Wm. IV. &
  1 Vict. c. 89, ss. 7 & 12.)
  18. Setting fire to coal-mines. (7 Wm. IV. & 1 Vict.
  c. 89, ss. 9 & 12.)
  19. Setting fire to stacks of corn, grain, coal or wood, &c.,
  or to any stook of wood. (7 Wm. IV. & 1 Vict. c. 89, ss.
  10 & 12.)
  IV. 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. Burglary. (7 Wm. IV. & 1 Vict. c. 86, ss. 3 & 7.)
  VI. Transportation for life, or not less than seven years.
  1. Personating soldiers or other persons entitled to prize-
  money, &c. on account of military services, or their
  representatives; or
  2. Forging the name or handwriting of any person so
  entitled, or of any officer or servant of Chelsea Hospital, or
  any writing concerning the payment of any such prize-money, &c.
  (2 Wm. IV. c. 53, s. 49.)
  VII. Transportation for life, or for any term of years.
  1. Taking on board any person (two or more, or committed thereto) binding the person taking the same to commit treason or any capital felony. (39 Geo. III. c. 104, s. 1.)
  2. Personating soldiers or other persons entitled to
  pensions, &c. on account of military services, or their
  representatives; or
  3. Forging the name or handwriting of any person so
  entitled, or of any officer or servant of Chelsea Hospital, 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. (26
  Geo. III. c. 156, s. 1.)
  2. Subjects of her majesty aiding, upon the high seas, the
  escape of prisoners of war after they have quitted the coast.
  (26 Geo. III. c. 156, s. 3.)
  IX. Transportation for life, or not less than seven years, or
  imprisonment for any term not exceeding seven years, with
  or without hard labour.
  1. Stealing or embezling her majesty's ammunition, naval
  or military stores. (4 Geo. IV. c. 53; 7 & 8 Geo. IV. c.
  27.)
  2. Sending letters threatening to kill any person, or to
  burn his house, stocks, &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 embezling or concealing any part thereof to the amount
  of 10L or upwards, &c. (5 & 6 Vict. c. 122, ss. 32 and
  83.)
  X. 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 confine-
  ment, or with both.
  1. Forgery of the seal or bonds of the South Sea Company
  (4 Geo. I. c. 4, s. 56; 11 Geo. IV. & 1 Wm. IV. c. 66,
  ss. 1 & 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; &c. 2 Geo. IV. c. 129, s. 4; 7 Geo. IV.
  c. 64, s; 7 Wm. IV. & 1 Vict. c. 84, ss. 2 & 3); of
  seals, policies, &c. of the London and Royal Exchange
  Assurance Companies (4 Geo. I. c. 18, s. 15; 11 Geo. IV.
  & 1 Wm. IV. c. 66, s. 1); certain Army Orders made forth
  in pursuance of 6 Geo. I. c. 11 & 17, 7 Geo. I. st. 1, c.
  30, 8 Geo. I. c. 20, or 9 Geo. I. c. 12, or of any authority
  to transfer the same (9 Geo. I. c. 12, s. 4; 11 Geo. IV. &
  1 Wm. IV. c. 64, s. 26); of the name or handwriting 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 sufferers' money
effects (12 Geo. I. c. 32, s. 9; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 1, 26, and 31); of Mediterranean fisheries (4 Geo. II. c. 18, s. 1; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 1 and 26); of the common seal, bonds, &c, of the English Linen Company (11 Geo. III. c. 120, ss. 17; 11 Geo. III. c. 66, ss. 1 and 26); of certificates, &c, of the Commissioners for the Reduction of the National Debt (32 Geo. III. c. 55, ss. 9; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 4, 2 & 3 WM. IV. c. 123; 3 & 4 WM. IV. c. 64, ss. 3; 7 WM. IV. & 1 Vict. c. 84, ss. 2 and 3); of the seal, policies, &c, of the Globe Insurance Company (39 Geo. III. c. 88, s. 22; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 1 and 26); of the name or handwriting of the Treasurer of the Ordnance, &c, to any appointment, &c, on the Bank (46 Geo. IV. c. 45, s. 9; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 4, 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); of the name or handwriting of the Receiver-General of Stamps and Taxes, or of his clerk, or of the Commissioners of Stamps and Taxes, to any draft, &c, on the Bank (46 Geo. III. c. 76, ss. 9; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 4, 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); of certificates of the issue of Exchequer-bills for carrying on public works and fisheries in the United Kingdom (57 Geo. III. c. 34, ss. 9; 3 Geo. IV. c. 86, ss. 54; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 1 and 26); of the name or handwriting of the Accountant-General, Barons, or Clerk of the Reports (of the Court of Exchequer), or of any cashier of the Bank, on any instrument relating to the agents' money or effects (11 Geo. IV. c. 113, s. 23; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 1 and 26); of the name or handwriting of the Accountant-General, Barons, or Clerk of the Reports (of the Court of Exchequer), or of any cashier of the Bank, on any instrument relating to the agents' money or effects (11 Geo. IV. c. 113, s. 23; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 1 and 26); of the name or handwriting of the Receiver-General of Stamps and Taxes, or of any appointment, &c, on the Bank (46 Geo. IV. c. 45, s. 9; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 4, 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); of certificates or appointments relating to public salaries, pensions, and allowances (3 Geo. IV. c. 113, s. 23; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 1 and 26); of certificates of certain stock, transferable at the Banks of England and Ireland respectively (5 Geo. IV. c. 53, s. 22; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 1 and 26); of the name or handwriting of the receiver-general of Exchequer, or Exchequer comptroller, &c, on any instrument relating to the agents' money or effects (11 Geo. IV. c. 53, s. 55; 11 Geo. IV. & 1 WM. IV. c. 66, ss. 4, 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); of stamps upon or relating to cheques or chequer-bills (51 Geo. IV. & 1 WM. IV. c. 66, ss. 1 and 26); of certificates, &c, as to annuities granted by the commissioners for the reduction of the national debt, or of instruments made by them relating thereto (10 Geo. IV. c. 24, s. 41; 7 WM. IV. c. 66, ss. 1 and 26; 2 & 3 WM. IV. c. 56, s. 19; 7 WM. IV. & 1 Vict. c. 84, ss. 1 and 3); of certificates and other documents in order to obtain pay or prince-money, due in respect of services performed by any person in the navy (11 Geo. IV. & 1 WM. IV. c. 20, ss. 85 and 88; 2 WM. IV. c. 40, s. 85); of Exchequer-bills, &c, Exchequer debentures, East-India bonds, &c.

As to the forgery of stamps on newspapers, the 8th & 9th WM. IV. c. 76, s. 1, appears to make that offence punishable under 10 Geo. III. c. 184, s. 4, in the case of the forgery of stamps on a newspaper, or newspaper-plate, or newspaper-paper, (see Lonsdale's 'Statute Criminal Law,' p. 81, note (c); the language of the Act, however, is not clear.)

The 59 Geo. III. c. 143, s. 10, appears to be repealed, so far as relates to the Customs, by 6 Geo. IV. c. 130, s. 2, by which the authority to stamp such documents is vested in the Commissioners of Customs; and by 10 Geo. IV. c. 56, s. 2, also, as to certificates relating to the duties of Excise, see 41 Geo. III. (U.S.) c. 61, s. 1.

1 See also 37 Geo. III. c. 141; 4 Geo. IV. c. 69 and 81 & 93 Geo. IV. c. 46, ss. 3, 4; 11 Geo. IV. & 1 WM. IV. c. 27; 7 Geo. IV. c. 19; 47 & 48 Geo. IV. c. 12; 7 WM. IV. & 1 Vict. c. 84; 8 Geo. IV. c. 117; 1 & 2 WM. IV. c. 51; 3 & 4 WM. IV. c. 84; 1 & 2 Vict. c. 140; and 3 & 4 Vict. c. 69, s. 14.

As to whether the forgery of Exchequer-bills, made out in pursuance of the same or similar orders, and before standing the stamp of that pardon in case of the forgery of other Exchequer-bills, was an offence punishable by imprisonment for two years, and the offender to find sureties for good behaviour for two years more, or to be compaigned from the court of King's Bench for a first offence, and for a first offence, to be sent to the house of correction, and for a second or subsequent offence, to be sent to the house of correction for a term not less than six months, and the offender to find sureties for good behaviour for one year more, see 13 Geo. IV. c. 56, s. 1, and the Exchequer-bills directed to be computed from the end of the law six months. (37 Geo. III. c. 146, s. 4.)
10. Privately or publicly using stamps provided in pursuance of any Stamp Act, with intent to defraud her Majesty of any duties granted by such act. (29 Geo. III. c. 184, s. 7; 56 Geo. III. c. 185, s. 33; & 5 Vict. c. 56, ss. 1 and 4.)

11. Buying, selling, or offering to remove or offering 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 & 6 Vict. c. 56, ss. 1 and 4.)

12. Transporting from St. Helena into England before the expiration of their term of transportation. (6 Geo. IV. c. 85, ss. 18; 4 & 5 Vict. c. 56, ss. 1 and 4.)

13. Riotously destroying places of worship or houses, or buildings used for the business of mines, &c. (7 & 8 Geo. IV. c. 3w, s. 8; & 4 & 5 Vict. c. 56, ss. 1 and 4; & 6 & 7 Vict. c. 10.)

XII. Transportation for life or not less than seven years, or imprisonment for any term not exceeding four nor less than two years. Being possessed, without lawful excuse, of forged dies, &c., or of any vellum parchment, or other thing 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 thing having thereon the impression, with intent to use the stamp then being thereon, for any instrument or thing liable to stamp duty, &c. (3 & 4 Wm. IV. c. 97, ss. 11 and 12; & 4 & 5 Wm. IV. c. 60.)

14. Forgery of any stamped or private or fraudulently using such stamps, or, without lawful excuse, being possessed of any paper or other material so privately or fraudulently stamped. (7 & 4 Vict. c. 96, s. 22.)

XIII. Transportation for life or not less than seven years, or imprisonment for any term not exceeding four 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. Sending threatening letters with intent to extort money, &c. (7 & 8 Geo. IV. c. 39, ss. 4 and 8.)

15. Destroying, cutting, or defacing any stamp, with intent to help to property which has been stolen, &c. (unless the person so taking such reward cause the offender to be apprehended and tried for the same.) (7 & 8 Geo. IV. c. 29, ss. 4 and 58.)

16. Forgery or damaging goods of silk, woolen, linen, or cotton, &c., whilst in progress of manufacture, or of 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.)

17. 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. 39, ss. 27.)

18. Destroying, &c., public bridges. (7 & 8 Geo. IV. c. 30, ss. 13 and 27.)

XIV. 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. Counterfeiting the queen's current gold or silver coin. (2 Wm. IV. c. 54, ss. 3 and 19.)

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. 54, ss. 4 and 19.)

Buying, &c., or putting off, &c., at a lower value than the same by its denomination imports, or importing into the kingdom the same or counterfeit coin, or passing the queen's current gold or silver coin, knowing the same to be counterfeit. (2 Wm. IV. c. 84, ss. 6 and 19.)

4. Having been convicted of uttering counterfeit coin intended to pass for the queen's current gold or silver coin; 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, or having falsely passed any of such offences. (2 Wm. IV. c. 84, ss. 7 and 19.)

5. Having been convicted of having possession of 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, afterwards committing the like offence. (2 Wm. IV. c. 54, ss. 8 in part and 19.)

6. Without lawful authority, making, having or dealing in, or having in possession, or using, any instrument adapted for counterfeiting the queen's current gold or silver coin. (2 Wm. IV. c. 34, 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. 34, ss. 11 and 19.)

8. Persons employed under the Post Office stealing, embezailing, secreting, or destroying post letters containing money, &c. (7 & 8 Geo. IV. c. 31, s. 8.)

10. Stealing post letters, or post letters from post offices, or from the officers of the post office, or from mailboxes; or stopping mail with intent to rob or search them. (7 Wm. IV. & 1 Vict. c. 36, ss. 27, 41, 42.)

11. Receiving letters or other property stolen, &c. (2 Wm. IV. c. 34, ss. 11 and 19.)

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 Vict. c. 36, ss. 33, 41, 42.)

XIV. 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, an heirless, &c. against her will, with intent to marry or defile her, &c. (9 Geo. IV. c. 51, s. 19.)

XV. 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 Manauafigh, &c. 36, ss. 19.)

XVI. 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 as true false legal or copies of records in the hand of the Master of the Rolls. (1 & 2 Vict. c. 94, s. 19 in part.)

2. Forgery of the signature of any Assistant Record Keeper, for the purpose of counterfeiting a certified copy of a record, or of the Seal of the Public Record Office. (1 & 2 Vict. c. 94, s. 19 in part.)

XVII. Transportation for life or not less than seven years, or imprisonment for any term not exceeding three years, with or without hard labour or solitary confinement, or with both.

1. Stealing in a dwelling-house at the value of 5s. or more. (7 & 8 Geo. IV. c. 29, s. 12; 2 & 3 Wm. IV. c. 82; & 4 & 5 Wm. IV. c. 44, s. 3; 7 Wm. IV. & 1 Vict. c. 90, ss. 1 and 2.)

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. 154, s. 2; 7 Wm. IV. & 1 Vict. c. 90, ss. 1 and 2.)

3. Castle-stealing or killing-cattle, with intent to steal the carcass or skin or any part of the cattle so killed. (7 & 8 Geo. IV. c. 29, s. 25; 2 & 3 Wm. IV. c. 62; & 3 & 4 Wm. IV. c. 44, s. 3; 7 Wm. IV. & 1 Vict. c. 90, ss. 1 and 2.)

4. Breaking, entering and stealing in buildings within the curtilage of a dwelling-house, but having no communication with the dwelling-house, either immediately or by means of a covered and independent passage, from the one to the other. (7 & 8 Geo. IV. c. 29, ss. 13 and 14; 7 Wm. IV. & 1 Vict. 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 Vict. c. 90, ss. 2 and 3.)

* The punishment for uttering, in respect of a first offence, is imprisonment not exceeding one year, with or without hard labour or solitary confinement, or with both.

† For the purpose of this and the next offence no building, although within the curtilage of a dwelling-house, will be deemed to be such dwelling-house, unless it is a building between which and the dwelling-house there is no communication, either immediate or by means of a covered and independent passage, from the one to the other.

‡ See below, the punishment for a first offence.
5. Stealing to the value of 10s. goods of silk, woollen, linen or cotton, &c., whilst exposed in any place during any stage of manufacture. (7 & 8 Geo. IV. c. 29 ss. 16; 7 Wm. IV. & 1 Vict. c. 90 ss. 2 and 3.)

6. Stealing goods, from vessels, &c., in ports or upon navigable rivers, canals, docks, sheds, workshops, warehouses, or magazines, &c., adjoining thereto. (7 & 8 Geo. IV. c. 29, ss. 17; 7 Wm. IV. & 1 Vict. c. 90 ss. 2 and 3.)

7. Maliciously killing, maiming or wounding cattle. (7 & 8 Geo. IV. c. 30, ss. 16; 7 Wm. IV. & 1 Vict. c. 90 ss. 2 and 3.)

8. Maliciously destroying hop-binds growing on poles in hop plantations. (7 & 8 Geo. IV. c. 30, ss. 18; 7 Wm. IV. & 1 Vict. c. 90 ss. 2 and 3.)

9. Stealing in a dwelling-house, &c., and by threats or menace putting any inmate in bodily fear. (7 Wm. IV. & 1 Vict. c. 87 ss. 5 and 7.)

10. Robbery or stealing from the person. (7 Wm. IV. & 1 Vict. c. 96, ss. 5 and 10.)

11. Plundering vessels in distress, or wrecked, stranded, or cast on shore, or anything belonging to any such vessel. (7 Wm. IV. & 1 Vict. c. 87, ss. 8 and 10.)

12. 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 12.)

13. Receiving, converting, &c., stolen goods, &c., with intent to defraud. (7 & 8 Geo. IV. c. 29 ss. 12 and 28.)

14. Without the authority of the Bank, making or being possessed of making, or attempting to make, any bank-notes, &c. (7 & 8 Geo. IV. c. 29 ss. 13.)

15. Without the authority of the Bank, engraving, making or using 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.)

16. XXI. Transportation for any term not exceeding fourteen years.

17. Aiding prisoners to escape, or in attempting to escape from prison, whether an actual escape be made or not. (4 Geo. IV. c. 64, ss. 43.)

18. Rescuing offenders sentenced to be transported or banished. (5 Geo. IV. c. 84, ss. 22.)


20. Forging, &c., of the queen's mark on silver or gold, or of any false or counterfeit coin or bullion. (7 & 8 Geo. IV. c. 29, ss. 4 and 54.)

21. Boatmen and others concealing, &c., or not reporting according, &c, in obstructing the officers, &c., or any other articles found by them on the coast, &c. (7 & 8 Geo. IV. c. 29 ss. 4 and 54.)

22. Bailment and others concealing, &c., or not reporting according, &c., in obstructing the officers, &c., or any other articles found by them on the coast, &c. (7 & 8 Geo. IV. c. 29 ss. 4 and 54.)

23. Transporting for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding three years, with or without hard labour or solitary confinement, or with both. (1 & 2 Geo. IV. c. 75 s. 1; and c. 76.)

24. XXI. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding three years, with or without hard labour, &c., or with both. (1 & 2 Geo. IV. c. 75, ss. 5 and 19.)

25. XXV. Transportation for any term not exceeding fourteen or confinement not exceeding five nor less than three years, with hard labour. (2 Wm. IV. & 1 Vict. c. 36 ss. 41 and 42.)

26. XXVI. Transportation for any term not exceeding fourteen years, or confinement not exceeding five years, or imprisonment not exceeding three years, with or without hard labour, &c., or with both. (2 Wm. IV. & 1 Vict. c. 36, ss. 41 and 42.)

27. Providing false affidavits, &c., in order to procure any person to be admitted as pensioner as the widow of an officer of the royal navy, &c. (11 Geo. IV. & 1 Wm. IV. c. 20, ss. 87 in part and 88.)

28. Bribing or enticing a person to escape from prison. (11 Geo. IV. & 1 Wm. IV. c. 20, ss. 86 and 88; 2 Wm. IV. c. 40.)

29. Aiding prisoners to escape, or in attempting to escape from prison, &c. (11 Geo. IV. & 1 Wm. IV. c. 20, ss. 86 and 88; 2 Wm. IV. c. 40.)

30. Making false affidavits, &c., in order to procure any person to be admitted as pensioner as the widow of an officer of the royal navy, &c. (11 Geo. IV. & 1 Wm. IV. c. 20, ss. 87 in part and 88.)

31. Impersonating a public officer. (2 Wm. IV. c. 4, s. 1.)

32. Forgery, &c., of marks on silver or gold, or of any marks of value. (7 & 8 Geo. IV. c. 22, s. 2.)

33. Forger, &c., of or disposing of any marks on silver or gold. (7 & 8 Geo. IV. c. 22, s. 2.)

34. Forger, &c., of marks on silver or gold or of any marks of value. (7 & 8 Geo. IV. c. 22, s. 2.)

35. XXIII. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding three years, with or without hard labour or solitary confinement, or with both.

36. XXIV. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding three years, with or without hard labour, solitary confinement, or with both.

37. XXV. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding three years, with or without hard labour, solitary confinement, or with both.

38. XXVI. Transportation for any term not exceeding fourteen years, or confinement not exceeding five nor less than three years, with hard labour.
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XXIX. **Transportation for seven years.**

1. By forcibly inducing persons, &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 their debters, or on which complaint shall 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 felons on their way for transportation. (16 Geo. II. c. 1, s. 1.)

3. Riotously assembling, to the number of five or more, to rescue offenders against the Acts relating to spirituous liquors; or assaulting persons who have given, &c. evidence, &c. against such offenders, &c. (24 Geo. II. c. 40, s. 28.)

4. Prisoners for debt not delivering in under the Lords' Act a true account of all their estate and effects, &c.† (32 Geo. III. c. 28, s. 17; 83 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. (32 Geo. III. c. 28, s. 13.)

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 sending or receiving grain. (11 Geo. II. c. 29; 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. (30 Geo. III. c. 2.)

8. Forgery 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. 144, s. 11.)

9. Forcibly rescuing offenders or 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. Forgery of documents within the time exceeding forty years with smuggling goods, or in company with only one person within five miles of the coast, &c. &c. (4 Geo. IV. c. 87, s. 65.)

11. Forgery 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 of France. (105 & 106 Geo. III. c. 25, s. 1.)

2. Administering oaths intended to bind the person taking the same to engage in any sedulous purpose, &c. &c., or to be of any association or confederacy formed for any such purpose, &c. (105 & 106 Geo. III. c. 25, s. 2.)

3. Counterfeiting foreign gold or silver coin, not permitted to be current within the realm. (37 Geo. III. c. 126, s. 2.)

4. Bringing any such coin into the realm with intent to utter the same. (37 Geo. III. c. 126, s. 3.)

5. Boxmen, &c. conveying annals, &c. which they know to have been swept for or otherwise taken possession of without being reported according to law, to any foreign ports, &c. and there disposing of the same. (1 & 2 Geo. IV. c. 75, s. 15.)

XXI. **Transportation for seven years, or imprisonment for any term not exceeding 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. (9 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 initiating or causing to appear any post marks, &c. &c. to be used in postage covers. (3 & 4 Vict. c. 96, 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, s. 6.)

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 in evidence such certificates, &c. with false or counterfeited seals &c. thereunto;

2. Forgery of the signature of any equity or common law judge of the Superior Courts at Westminster, to any judicial or official document, or tendering in evidence any such document with a false, &c. signature of any such judge thereto;

3. Printing copies of private acts or of the journals of either House of Parliament, whose common seal or signet has 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 purports to have been printed. (9 & 10 Vict. c. 113, s. 4.)

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, embezzling, secreting or destroying post-letter. (7 Wm. IV. & 1 Vict. c. 30, ss. 20 and 48.)

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, or burials, directed by law to be transmitted to the Crown or either House of Parliament, not being made or being 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, making false entries in the books or registers of debts due, or in the books or registers of dividends making false entries in such entries, &c. (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 Anne, c. 11; 10 Anne, c. 99; 5 Geo. I. c. 2, s. 9; 52 Geo. III. c. 143, s. 1; 7 & 8 Geo. IV. c. 28, ss. 8 and 9); of the stamps or seals used for marking strips for sealing casks or barrels, in pursuance of 4 Geo. III. c. 37, An Act for the better establishing a manufactory of Casks and Barrels at Wincle, in the County of Chester, &c. (4 Geo. III. c. 37, s. 26; 52 Geo. III. c. 143, s. 1; 7 & 8 Geo. IV. c. 28, s. 8 and 9; 1 Wm. IV. c. 17, s. 1) or of the stamps or seals, or the stamping of the seals or stamps or stamps of the Court of Admiralty or High Court of Appeal of Fries, &c., to any instrument relating to the money or effects of the suitors of those courts (53 Geo. IV. c. 161, s. 12; 7 & 8

* &c. see also 1 & 2 Geo. IV. c. 84, s. 1, which, under certain circumstances, inflict transportation for seven years, or imprisonment not exceeding three years.

† The first offence is punishable, on summary conviction, with imprisonment and labour for any term not exceeding three months nor less than one month.

§ There are still some cases to which this enactment is applicable.

As regards copies of registers of marriages, it would appear that this offence ceased to exist when the registers were removed to the department of the Registrar General, and marriage, in England, be committed with respect to such copies only as were transmitted hereafter to be filled in and entered into operation. It is still however, as regards registers of baptism or burial. (see 4th sect. of 6 & 7 Wm. IV. c. 46.)
Geo. IV. c. 29, ss. 8 and 9); of quarantine certificates (6 Geo. IV. c. 78, s. 25; 7 & 8 Geo. IV. c. 28, ss. 8 and 9); of the name or handwriting of her Majesty's Commissioners of Woods, Forests, Land Revenues, Works and Buildings, to any person for or in respect of any place, or any thing therein, or of such commissioners, &c. (7 & 8 Geo. IV. c. 28, ss. 8 and 9; 10 Geo. IV. c. 50, s. 124; & 3 Wm. IV. c. 1, s. 1); or of the process of informing courts of the recovery of debts and debts of the second instance, or of the execution of such determinations (7 & 8 Geo. IV. c. 28, ss. 8 and 9; & 7 & 8 Vict. c. 19, s. 5 in part).

2. Obstructing the execution of process, &c. within Suffolk Place or the Mint, in the parish of St. George, in the county of Surrey (7 & 8 Geo. I. c. 26, 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 liable to prosecution (7 & 8 Geo. IV. c. 28, ss. 8 and 9; 6 & 7 Wm. IV. c. 85, s. 30.).

5. Sodomising marriages (except in the case of Quakers or Jews, or by special licence) in any other place than a church or registered office, being so in any other place than the register of the district, &c. (7 & 8 Geo. IV. c. 28, ss. 8 and 9; 6 & 7 Wm. IV. c. 85, ss. 30.)

6. Superintendent registrars issuing certificates for marriage, or registering marriages, contrary to law; or registrars or superintendent registrars issuing licences for marriage, or sodomy marriages, contrary to law. (7 & 8 Geo. IV. c. 28, ss. 8 and 9; 6 & 7 Wm. IV. c. 85, s. 40; 7 Wm. IV. & 1 Vict. c. 22, s. 3.)

7. Destroying, counterfeit or inserting false entries in, the register-books directed to be performed by the act for registering births, deaths, and marriages in England; or forging the seal of the register-office. (7 & 8 Geo. IV. c. 28, ss. 8 and 9; & 6 & 7 Wm. IV. c. 85, 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, ss. 9 and 11.)

9. Simple larceny. (7 & 8 Geo. IV. c. 29, ss. 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 enclosed lands (for a second offence*); or offending a second time, or in any other offence, in deer 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. 3, 4, and 26.)

12. Officers heating or saving 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 seiving 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 11., or growing elsewhere, if such value or amount exceeds 8. (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 stealing thereof, or the injury done is to the amount of a shifting at the least, and if the offender has been twice previously convicted.† (7 & 8 Geo. IV. c. 29, ss. 3, 4, and 39; and c. 30, ss. 20 and 27.)

17. Stealing, or damaging with intent to steal, or maliciously destroying &c. plants, vegetable products &c., growing in gardens, conservatories &c., if the offender has been

* The first offence is punishable on summary conviction only, by fine not exceeding 40. & 7 Wm. IV. c. 29, ss. 4, and 9.)

† The last two sections are convicts to be imprisoned for not exceeding twelve calendar months in addition to the punishment to which the offender was subject at the time of such attempt.
of debts or damages in personal actions, without lawful autho-
* 28 Geo. IV. c. 28, s. 8 and 9; 7 & 8 Vic. c. 15, s. 5 in part.*

32. Workmen in mines in Cornwall removing or concealing ore with intent to defraud the proprietors of such mines. (2 & 3 Geo. IV. c. 10, s. 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. 51, 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. 81, 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 buoy, &c. belonging to vessels or attached to the anchors or cables of vessels, whether in distress or otherwise. (1 & 2 Geo. IV. c. 76, 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. Slaughtering or killing horses or other cattle without taking out the license and giving the notice required by the Act for regulating slaughtering-houses, or doing any act or thing within the hours limited by the Act, or not delaying to do so, when required by the Inspector. (20 Geo. III. c. 71, s. 8.)

IV. MISDEMEANOURS.

Misdemeanors are punishable as follows, viz. with:

I. Transportation for life.

1. 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. 7.), without any lawful excuse, after three calendar months from such sentence. (10 Geo. IV. c. 7, s. 36.)

II. Banishment for life.

1. Jews or ministers 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 United Kingdom within twenty days after being released from the time mentioned in such licence, &c. (10 Geo. IV. c. 7, s. 31.)

3. Within any part of the kingdom, becoming a Jew or minister of any Society of the Church of Rome bound by monastic or religious vows. (10 Geo. IV. c. 7, s. 84.)

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 of more than.

1. Not being a contractor with the Commissioners of the Navy, Ordnance or Victualling Office for her Majesty's use, selling, receiving or being possessed of any warlike or naval, ordnance, victualising or other public stores, without being able to produce a certificate from the Commissioners of the Navy &c., expressing the occasion &c. of such stores being so in possession. (9 & 10 Wm. III. c. 41; 9 Geo. I. c. 8, s. 3; 39 Geo. III. c. 22.)

The I of Geo. IV. c. 76, s. 4, contains a similar provision as regards books &c. within the jurisdiction of the Cinque Ports, but subjects the offender to transportation not exceeding fourteen years.

This and the next two offenses do not apply to members of Female Societies (10 Geo. IV. c. 7, s. 37.)

39. 29 & 30 Geo. III. c. 89, s. 1, imposes the above penalties in respect of those offenses, by enacting that persons who commit them in the port of London, or having them there, or having them to have been stored, and shall, on being convicted thereof in due form of law, be transported, or, if the Judge shall think fit, to be severely whipped in public or privately, or in any other manner. The sentences of such persons are directed to be transported by the Queen's order and if the Judge shall think fit to mitigate or commute the punishment as above mentioned, the punishment of receivers law, however severe alone, whatever the Act 9 & 10 Geo. IV. c. 22, s. 34 and 35. Is there fore becomes a question how for such alteration has modified the above punishment.

40. Geo. III. c. 89, ss. 1 and 7; 54 Geo. III. c. 60; 55 Geo. III. c. 127; 56 Geo. III. c. 138, s. 2.

2. Being a second or even third time convicted (not being a contractor with the Commissioners of the Navy &c.) of being possessed of &c. certain of her Majesty's or other public stores, the being possessed of the same, which would not otherwise, as the first offence, subject a person to transportation. (9 & 10 Wm. III. c. 41: 39 & 40 Geo. III. c. 89, ss. 5 and 7; 54 Geo. III. c. 60; 55 Geo. III. c. 127; 56 Geo. III. c. 138, s. 2.)

IV. Transportation for any term not exceeding fourteen nor less than seven years, or fine or imprisonment, or both, such imprisonment to be with or without hard labour or solitary confinement, or with both.

1. Bankers, merchants &c. converting to their own use money or securities intrusted to them to be applied for a specified purpose. (7 & 8 Geo. IV. c. 29, ss. 4 and 48.)

2. Bankers, merchants &c. converting to their own use chattels, securities &c. intrusted to them for a special purpose, but without authority to sell or negotiate &c. the same. (7 & 8 Geo. IV. c. 29, ss. 4 and 48.)

3. Factors or agents pledging goods or merchandise intrusted to them for sale, as a security for money &c. borrowed &c. by them. (7 & 8 Geo. IV. c. 29, ss. 4 and 51.)

4. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment with hard labour for any term not exceeding three years.

1. Doing in any land, by sight, to the number of three or more (any of them armed), for the purpose of committing any theft or destroying game or rabbits. (9 Geo. IV. c. 69, s. 9.)

VII. Transportation for seven years.

1. Countertopping foreign copper or other coin of a less value than silver, not permitted to be current in this kingdom (for the second offence). (43 Geo. III. c. 159, s. 8.)

VIII. Transportation for seven years, or fine or imprisonment, or both, such imprisonment to be with or without hard labour or solitary confinement, or with both.

1. Stealing, obliterating or destroying records or original documents belonging to Courts of Record, &c. (7 & 8 Geo. IV. c. 29, ss. 4 and 21.)

2. Stealing, destroying or concealing wills or other testamentary instruments, either during the life of the testator or after his death. (7 & 8 Geo. IV. c. 29, ss. 4 and 22.)

3. Stealing title-deeds. (7 & 8 Geo. IV. c. 29, ss. 4 and 23.)

4. Obtaining property by false pretences. (7 & 8 Geo. IV. c. 29, ss. 4 and 53.)

IX. Transportation for seven years, or fine and imprisonment.

1. Forgery of permits, or knowingly accepting or receiving forged permits. (2 Wm. IV. c. 16, s. 4.)

X. Transportation for the term of fourteen years, or the like punishment as for a misdemeanor at common law.

1. Purchasing or receiving anchors &c. which have been swept or otherwise taken possession of, whether the same have belonged to vessels in distress or otherwise, if such anchors &c. have not been reported &c. according to law. (1 & 2 Geo. IV. c. 75, s. 12; and c. 76, s. 10.)

XI. Transportation for seven years, or imprisonment without hard labour.

1. Assaulting officers on account of the exercise of their duty in the preservation of vessels in distress, &c. (9 Geo. IV. c. 51, s. 24.)

2. Fine of 40l., or if the offender has not goods or chattels, lands or tenements to the value of 40l., then imprisonment by the space of one half-year; &c. and, besides the foregoing punishment, the offender may be imprisoned.

For the purposes of 9 Geo. IV. c. 60, the word "game" includes hare, pheasants, partridges, grouse, bustards, game birds, and beagles. (See 13 & 14 Geo. IV. c. 69, s. 1.)

The punishment for a first offence is imprisonment not exceeding one year.

2. See the 8 & 9 Vic. c. 109, s. 17, which declares that persons winning such game, &c. by chance, may be kept in prison for the time of derelicting such money, &c. by false pretences, and shall be punished accordingly. (See 8 & 9 Vic. c. 109, s. 17.)

3. The punishment for a misdemeanor at common law is fine and imprisonment.

The only cases are when the offender is prosecuted under 5 Eliz. c. 9. that he is liable to this portion of these penalties. If prosecuted at common law he is punishable with fine, &c. of which either may be sentenced to the other penalties stated above. The common law offence extends also to imposition of property in any judicial proceedings.
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 therefor be received as a witness in any Court, unless the judgment given against him be reversed.

1. Subornation of perjury in any of the Queen's Courts of Chancery or Courts of Record, or in any Lact, View of Francisques, or in any Court of the United of the United of the Court, or in the Court or Courts of the Stannary in the counties of Devon and Cornwall; or subornation witnesses sworn to testify that peremptory rei memoriam.  ⁶ (5 Eliz. c. 9, s. 2; 2 Geo. II. c. 25, s. 2; 3 Geo. IV. c. 114; 7 Wm. IV. & 1 Vict. c. 25.)

XIII. Fine of 20l. and imprisonment for six months; ⁷ 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; 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 therefor be received as a witness in any Court, 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.  (6 Eliz. c. 5; 21 Janc. I. c. 26, s. 8; 2 Geo. II. c. 25, s. 2; 3 Geo. IV. c. 114; 7 Wm. IV. & 1 Vict. c. 23.)

2. Sowen 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 Act of Lord High Admiral, of the purchase 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 preventing marriages; ⁸ 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. 4, s. 98; 7 Wm. IV. & 1 Vict. c. 23; 3 & 4 Vict. c. 72, s. 4.)

6. Making false statements for the purpose of their being inserted in registers of births, deaths, or marriages.  (6 & 7 Wm. IV. c. 4, s. 99; 7 Wm. IV. & 1 Vict. c. 29.)

XIV. Transportation for seven years, or imprisonment with hard labour for any term not exceeding three years.

1. Assaulting or obstructing persons duly employed for the purpose of the peace or for the public good, with high official capacity.  (6 & 7 Wm. IV. c. 4, s. 97; 7 Wm. IV. & 1 Vict. c. 29.)

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 publicized or whipped at public meetings 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 breach the public peace, or which the public peace may be endangered; or having fire or other arms, or any explosive or dangerous matter or thing near the queen's person, with intent to use the same to injure or alarm her.  (5 & 6 Vict. c. 88, s. 2.)

XVI. Transportation for five 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; and the offender, if a female, may be subjected to such imprisonment as aforesaid.

1. Receiving property the stealing, taking, &c. whereof is made an indictable misdemeanour by 7 & 8 Geo. IV. c. 29, knowing the same to have been unlawfully stolen, taken, &c.  (7 & 8 Geo. IV. c. 26; 4 Vict. c. 17.)

2. Boatmen and others concealing &c. and not reporting according to law, or obliterating the marks &c. on, articles found by them on the coast (provided the stealing of such articles or the act immediately connected is a punishable misdemeanour).  (1 & 2 Geo. V. c. 75, s. 1; and 76.)

3. Maliciously destroying the dams of fish-ponds or millponds, or poisoning fish-ponds.  (7 & 8 Geo. IV. c. 90, ss. 15 and 27.)

XVII. Transportation for seven years, or imprisonment with hard labour for any term not exceeding two years.

1. Taking or destroying game, or rabbits by night, in any land or on any public road, path &c., or at the openings, gates &c. from such land into such public road &c., or entering any such land, by night, with any instrument for that purpose.  (5 & 6 Geo. IV. c. 69, ss. 1, 2; 7 & 8 Geo. IV. c. 26.)

XVIII. Transportation for any term not exceeding seven years, or imprisonment not exceeding two years.

1. Being guilty of an unlawful combination or conspiracy.  (37 Geo. III. c. 129, s. 1; 20 Geo. III. c. 79, ss. 2 and 8; 52 Geo. III. c. 104, s. 1; 57 Geo. III. c. 19, s. 25.)

2. Being present at meetings for the purpose of drugging persons to the use of arms &c., such meetings being unauthorized by her Majesty or the lieutenant or two justices of the peace of the county or riding, by commission or otherwise; or drugging persons to the use of arms &c.  (90 Geo. III. & 1 Geo. IV. c. 1, s. 1.)

XIX. Imprisonment for life, loss of the offender's right hand, and forfeiture of his goods and chattels, and of the profits of his lands during life.

1. Assisting any judge of the queen's courts of law or equity, or any justice of assize, oyer and terminer, or general gaol delivery, whilst acting in his official capacity; or striking any person in the presence of any such judge or justice.  (Hawk. P. c. b. 1. c. 21, s. 3; Seventh Report of the Criminal Law Commissioners, pp. 49 and 160.)

XX. Imprisonment for life and forfeiture of the offender's goods and profits of his lands.

1. Recruising prisoners being in the presence of any such judge who shall have the power of his official capacity.  (Hawk. P. c. b. 1. c. 21, s. 5; Seventh Report of the Criminal Law Commissioners, pp. 49 and 160.)

XXI. Imprisonment for life, and forfeiture of all goods and chattels of the offender.

1. Being a second time convicted of publishing fond, fantastical or false prophecies, to the intent thereby to make any rebellion or other disturbance &c. within the queen's dominions.  (3 Eliz. c. 15, s. 3.)

XXII. Imprisonment for life.

1. Hearing and being present at any other form of common prayer &c. than is mentioned and set forth in the Book of Common Prayer, or in speaking in derogation thereof, having been twice previously convicted of the same.  (6 & 6 Edw. VI. c. 1, s. 6; 13 & 14 Car. II. c. 4, s. 24.)

2. Clergymen of the Established Church using any other form of common prayer &c. than is set forth in the Book of Common Prayer, or speaking in derogation thereof, having been twice previously convicted of any such offence.  (1 Eliz. c. 2, s. 6; 13 & 14 Car. II. c. 4, s. 24.)

* See also 12 Geo. I. c. 24, s. 4 (made perpetual by 21 Geo. II. c. 23) as to subornation of perjury and perjury &c. by attorneys &c., for which the Court may cause them, after an examination in a summary way, to be transported for seven years.  8 The punishment for the common offence is the same as for subordination of perjury; and perjury at common law must be proved.  ⁷ Persons are usually carried on for the offence as at common law, and not under the statute.  ⁸ There is a great number of similar acts, besides those mentioned above, which are punishable at common law, for which trial by jury is necessary, or to be punishable as perjury; but it would have occupied too much space to have inserted them here.

This and the next four offences subject the persons committing them to the punishment of perjury.

It may be a question whether the 2 & 6 Vict. c. 51, s. 2, notwithstanding the fact that other provisions are declaratory, or to be punishable as perjury, or to be punishable as perjury, it but it would have occupied too much space to have inserted them here.
3. Persons not having any spiritual promotion committing any such last-mentioned offence, after their first conviction. 1 (1 Eliz. c. 2, s. 8; 15 & 16 Car. II. c. 4, s. 24.)

4. For attempting or conspiring anything in derogation of &c. the Book of Common Prayer, or compelling or causing any person or other minister to use any other form of common prayer &c. than is mentioned in the said book, or in saying or keeping any place of worship, or in saying common prayer &c. in the form mentioned in the said book, having been twice previously convicted of any such offence. 2 (1 Eliz. c. 2, s. 11; 15 & 16 Car. II. c. 4, s. 34.)

12. Imprisonment, or being deprived of all his spiritual benefices or promotions or sitting or acting in any place of worship, after his second conviction; or for his second or third offence, to be deprived of all his spiritual promotions. 1 (1 Eliz. c. 2, s. 1, s. 5, &c.)

13. The punishment for the first offence is imprisonment for one year. 1 (Eliz. c. 2, s. 5.)

The punishment for the first offence is forfeiture of 100 marks, or, if the offender do not pay the same within six weeks after his conviction, six months imprisonment instead; and for the second offence is forfeiture of 400 marks, or, if the offender do not pay the same within six weeks after his conviction, twelve months imprisonment instead. 1 (1 Eliz. c. 2, s. 9, 10, 12, and 13.)

24. The punishment for any term not exceeding twelve months imprisonment, nor less than six months, and the offender to be liable to such other punishment as may by law be inflicted in cases of high misdemeanors.

31. Refusing to give any information tendered to excite hatred of the queen, &c., as having been previously printed in some foreign paper which has not been so printed. 38 Geo. III. c. 78, s. 24.

32. Fine and imprisonment, with or without hard labour or solitary confinement, or with both.

33. Refusing to deliver up &c. post-offices which ought to have been delivered to any other person, or post-offices which shall have been found by the person so refusing, or by any other person, &c. 7 Wm. IV. & 1 Vict. c. 36, ss. 31 and 42.

35. Fine and imprisonment, and such corporal punishment by public or private whipping as the court shall direct. 5 Geo. IV. c. 77, s. 2, 3. and c. &c.

52. The Church of England was deprived of all rights and privileges within the United Kingdom, admitting any person to become a member of any such order or society. 10 Geo. IV. c. 7, s. 23.

57. 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.

58. 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. 8.)

77. Forgery, &c. of protection from service in the navy. 5 & 6 Wm. IV. c. 24, s. 3.

78. 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.

79. Executing &c. renewed ecclesiastical leases, knowing the recital required by law contained therein to be false. 6 & 7 Wm. IV. c. 76, s. 6.

80. 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.)

81. Making, &c. false declaration of being qualified to be elected a member of the House of Commons. (1 & 2 Vict. c. 48, s. 7.)

82. Frauds in assignments of pensions for service in her Majesty's navy, royal marines or ordnance. (2 & 3 Vict. c. 51, s. 8.)

83. 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.)

84. Officers of railways making false returns, under the discretion of the entrance, commitment or discharge of such prisoners, or detaining prisoners for non-payment of fees.* (55 Geo. III. c. 50, s. 13.)

85. Fishing off, &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.)

86. Buying or offering to buy, or procuring 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.)

3. 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. 2 (55 Geo. III. c. 50, ss. 4 and 5.)

4. Officers of game or Excise by their 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.)

5. By false certificates or representations endeavouring to obtain from Chelsea Hospital any pension, privilege or advantage. 3 (7 Geo. IV. c. 16, s. 25.)

6. 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.)

62. Jesus, or members of any religious order or society of the Church of Rome, and other societies which are of a contrary nature, within the kingdom, admitting any person to become a member of any such order or society. 10 Geo. IV. c. 7, s. 23.

63. 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.)

64. 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. 8.)

65. 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. 83); or the Copyhold Commissioners (4 & 5 Vict. c. 85, s. 94).

66. Forgery, &c. of protection from service in the navy. (5 & 6 Wm. IV. c. 24, s. 3.)

67. Executing &c. renewed ecclesiastical leases, knowing the recital required by law contained therein to be false. (6 & 7 Wm. IV. c. 76, s. 6.)

68. 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.)

69. Making, &c. false declaration of being qualified to be elected a member of the House of Commons. (1 & 2 Vict. c. 48, s. 7.)

70. Frauds in assignments of pensions for service in her Majesty's navy, royal marines or ordnance. (2 & 3 Vict. c. 51, s. 8.)

71. 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.)

72. Officers of railways making false returns, under the discretion of...
Act for regulating railways, to the committee of the Privy Council for Trade. (3 & 4 Vict. c. 97, s. 4.)
23. Making false returns of corn, under the Act regulating the importation of corns. (5 & 6 Vict. c. 14, s. 42.)
24. Making false entries in the Register Book of Copyrights. (5 & 6 Vict. c. 45, 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). (8 & 9 Vict. c. 47, s. 3 in part.)
30. Corruptly taking any reward for aiding persons to recover stolen &c. dogs. (8 & 9 Vict. c. 47, s. 6.) 31. Obstructing 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.
40. Blasphematic or seditious libels.
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. Wilfully disobeying any statute, by doing what it prohibits or omitting what it commands, whereby the public are or may be injured.
44. Wilfully 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. Fraudulent misapplication by public officers of property under their control as such officers.
49. Unlawfully, and contrary to oath of office, disclosing the matter of 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. Contempts of courts of justice or magistrates, by uttering any words, or more menacing or menacing words, or by as to 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, interrupting the proceedings of courts of justice.
53. The wilful omission by judicial officers to do their duty.
54. Oppression by judicial officers.

*The first offence is punishable on summary conviction before two or more justices by payment of such sum, not exceeding 25l., as to the justice shall award.*

[This and the following fifty-two offences (29 to 44 inclusive) are made misdemeanours, by the Criminal Law Amendment Act, 1861 (6 & 7 Vict. c. 102).]

2, 3 & 4. Vict. c. 98, s. 70. [These offences, when committed for a second time, were made punishable at the discretion of the court, by 60 Geo. Ill. 1 & 2 Geo. IV. c. 4; but 12 Geo. IV. 1 & 2 Wm. IV. c. 23, repealed the latter portion of the punishment.]

LAW

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 receiving their venire fees or any mode of chance.
60. Witnesses refusing to be sworn or to give evidence in judicial proceedings.
61. Unlawfully preventing witnesses from giving evidence in judicial proceedings.
62. Endavouring 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 inquest.
66. Glaazers and others, contrary to their duty, allowing dead bodies to remain unburied or 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. Building or selling wines.
73. Selling unwholesome provisions.
74. Maliciously exposing persons labouring under contagious diseases in places of public resort.
75. Common innominate.
76. Corrupting wells or springs used by the public.
77. Innkeepers refusing to receive travellers, their lads 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.
XXXI. Forfeiture, fine not exceeding 200l., and costs of suit, and also. Such further fine or 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 Commissioners of Her Majesty's Ordnance or a Vestigial Office for Her Majesty's use) of any of her Majesty's stores called can-vas, or bewer, otherwise called buntin, or of any cordage wrought with one or more worsted threads, or of any other public stores, or same not being charged to be new, or not more than one-third worn. (38 & 40 Geo. III. c. 89, s. 2; 54 Geo. III. c. 60; 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. (38 & 40 Wm. IV. c. 114, s. 1. i. c. 8; 17 Geo. II. c. 40; 29 & 40 Geo. III. c. 88, s. 2; 54 Geo. III. c. 59; 55 Geo. III. c. 127; 56 Geo. III. c. 138, s. 2.)
XXXII. Fine not exceeding 500l., or imprisonment for any term not exceeding two years, or both.
1. Aiding the escape of convicts from New South Wales or Van Diemen's Land. (9 Geo. IV. c. 83, s. 34.)
XXXIII. Imprisonment, with or without hard labour, for such term as the court shall determines.
1. Unlawfully and carnally knowing girls above the age of ten and under age of twelve years. (9 Geo. IV. c. 31, s. 17.)

2. Unlawfully taking, or killing hares or conies, in the night time, in warrens. (7 & 8 Geo. IV. c. 29, ss. 4 and 30.)

3. Unlawfully destroying, or despoiling any birds running through or in lands adjoining or belonging to dwelling-houses. (7 & 8 Geo. IV. c. 29, ss. 4 and 34.)

4. Unlawfully destroying turpik or toll gates or houses, &c. (7 & 8 Geo. IV. c. 29, s. 34.)

5. 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 or proceedings in Parliament, or newspapers, or other printed papers sent by the post, without covers or in covers open at the sides. (7 Wm. IV. & 1 Vict. c. 36, ss. 32 and 42.)

6. Forgery of bills, or false impositions or imitations of bills, &c. (1 & 2 Wm. IV. c. 22, s. 25;) of stage-carriage tickets (2 & 3 Wm. IV. c. 120, s. 32;) or of the licences or tickets of drivers of hackney-carriges, drivers of stage-carriges, or watermen (1 & 2 Wm. IV. c. 79, s. 12.)

7. Frauds in applying for hackney-carriges or stage-carriage licences. (1 & 2 Wm. IV. c. 22, s. 33; 2 & 3 Wm. IV. c. 10, s. 3.)

8. Compounding offences, or otherwise offending against the provisions of the 18 Eliz. c. 5 (An Act to redress disorders in common lodging Eliz. 6, s. 4; 27 Eliz. c. 10; 56 Geo. III. c. 138, s. 2.)

9. Resisting the execution of any legal process, execution, or extent, taken out by persons having debts owing to them from persons residing within the Parishes, Savoy, Salisbury Court, Ram Alley, Mitre Court, Fuller's Rest, Baldwin's Gardens, Montague Close, or the Minorities, Mint, Clink, or Deadman's Place. (6 & 9 Wm. III. c. 27, s. 12; 56 Geo. III. c. 138, s. 2.)

10. Illegal brokerage. (53 Geo. III. c. 141, s. 9.)

11. Persons having the custody of offenders ordered to be confined in Parkhurst Prison, or Pentonville or Millbank Prison, ready to be committed to such offenders, or to the custody of persons employed about the performance of divine service. (9 Geo. IV. c. 31, s. 25.)

12. 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.)

13. Altering, destroying, counterfeiting, or trafficking in the register-tickets with which merchant seamen are required to provide themselves. (7 & 8 Vict. c. 112, s. 22.)

14. 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.)

15. Masters of merchant ships, without the sanction of the consul, &c., discharging or abandoning abroad persons belonging to their ships or crews, or, in case any such person should desert, or be neglected, or have been abandoned in writing to such consul, &c. (7 & 8 Vict. c. 112, s. 46.)

16. Masters, mates, or other officers of merchant ships, wrongfully foregoing on shore, or leaving behind on shore or at 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.)

17. 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 of the requisite place of storage, or, in 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.)

**This offence does not extend to angling in the daytime; but persons desiring to use angling as a trade, or as a means of livelihood, are obliged to obtain a licence under the provisions of the Act, which contains regulations and restrictions designed to protect the interests of the angling fraternity.*

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* See also 9 Geo. IV. c. 51, s. 50, which makes it a misdemeanour, punishable with imprisonment for such term as the court shall think fit, to prevent merchant ships to force on shore or refuse to bring home all such men of the merchant marine as they can carry or can with advantage return to England. The effect of the offences of Chapmastry and Maintenance is recommended by the Criminal Law Commission (Fourth Fifth Report.)

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2. Being armed, assaults Excise officers whilst searching for or seizing commodities forfeited under any Act relating to the Excise or Customs, or whilst endeavouring to arrest offenders. (7 & 8 Geo. IV. c. 58, s. 10.)

3. Improving for any term not exceeding three years, with or without hard labour or solitary confinement, or with both.

4. Being possessed 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.)

5. Improving for any term not exceeding three years, with or without hard labour.

6. Bankruptcy of holders 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. 24; 7 & 8 Vict. c. 111, s. 30.)

7. Publishing or threatening to publish libels, &c. with intent to extort money, &c. (6 & 7 Vict. c. 66, s. 9.)

8. Improving for one year and grievous fine for the queen's pleasure; or if the offended have not whereof, imprisonment for three years.

9. Misrepresentation by sheriffs, coroners, or other bailiffs. (3 Edw. I. c. 9.)

10. Improving for one year and grievous fine; or if the offended have not whereof, imprisonment for two years.

11. Bailiffs not being ready, on the hue and cry, to arrest felons. (3 Edw. I. c. 9.)
XLVI. **Improvement** with or without hard labour for any term not exceeding two years, and fine if the court shall think fit; and the offender may be required to find sureties for keeping the peace.

1. Assails with intent to commit felony, or on any place or road, 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. 81, s. 25); or on special constables.*

2. Maliciously publishing seditious libels, knowing them to be false. (6 & 7 Vict. c. 96, s. 4.)

**XLVII.** _Improvement_ 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. c. 1 & 2 Wm. IV. c. 1, s. 1.)

2. Bankrupt, within three months next preceding his bankruptcy, of obtaining goods on credit under the false pretence of selling in the ordinary course of trade. (6 & 6 Vict. c. 129, s. 35.)

3. Drunkenness or other misconduct of servants of railway companies‡

**XLVIII.** _Discourtesy_ for a term not exceeding two years.

1. Embracing on board slaves in the capacity of petty officers, seamen, &c. (5 Geo. IV. c. 119, 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 & 5 Vict. c. 97, s. 18.)

**XLIX.** _Improvement_ 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 further improve himself before they be given.

1. Withholding, fraud, forgery, selling, &c., or pretending to discover where property supposed to be stolen or lost may be found. (9 Geo. IV. c. 5, s. 4; 56 Geo. III. c. 138, s. 2.)

2. _Improvement_ not exceeding eighteen months, or with or without hard labour.

1. Dog-stealing; for the second offence‡. (8 & 9 Vict. c. 47, s. 2 in part.)

L. **Forfeiture** of goods and chattels, real and personal, and the offender not having 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 oblogeance before the passing of the 1 Eliz. c. 1.§ (1 Eliz. c. 1, ss. 27 and 28; 7 & 8 Vict. c. 102.)

LIV. **Improvement** 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 current copper coin, or being possessed of three or more pieces of such coin with intent to utter the same. (2 Wm. IV. c. 84, ss. 12 and 19.)

* Assaults on special constables may also be punished on summary conviction before two justices. (See 1 & 2 Wm. IV. c. 41.)

But see 7 Wm. IV. & 1 Vict. c. 5, s. 5, which limits the time for which the court has discretion to allow imprisonment on a complaint before a magistrates to a term not longer than one month as a time, or three months in a year. It may be a question whether the above provision, by the Statute 20 Geo. IV. c. 46, s. 3, does not empower the court to impose a term exceeding three months in the case of disqualification of a person, the judgment of which will have an effect of disfranchising a person, or to impose a term exceeding three months in the case of disqualification of a person, the judgment of which will have an effect of disfranchising a person.

† The first offence is punishable on summary conviction, with imprisonment not exceeding a calendar month, or fine not exceeding 10s., if the justice before whom complaint is made directs it to be so decided upon it, instead of sending it to the Quarter-Sessions.

‡ The second offence is punishable on summary conviction, with imprisonment not exceeding six calendar months, or with or without hard labour, or with forfeiture not exceeding 200l. over and above the fine of the value of the goods or goods. The offence shall in no case exceed £400.

§ This forfeiture, being by statute, does not, as above observed, constitute the offence of forgery.

‖ The repeal of this offence is recommended by the Commissioners for reforming the offender in such cases.

* But see 7 Wm. IV. & 1 Vict. c. 5, s. 5, which limits the time for which the court has discretion to allow imprisonment on a complaint before a magistrate to a period not longer than one month as a time, or three months in a year. It may be a question whether the above provision, by the Statute 20 Geo. IV. c. 46, s. 3, does not empower the court to impose a term exceeding three months in the case of disqualification of a person, the judgment of which will have an effect of disfranchising a person, or to impose a term exceeding three months in the case of disqualification of a person, the judgment of which will have an effect of disfranchising a person.

**L.** _Improvement_ for any term not exceeding one year, with or without hard labour or solitary confinement, or with both.

1. Maliciously publishing seditious libels. (6 & 7 Vict. c. 96, s. 5.)

**LV.** _Solitary improvement_ for a space not exceeding twelve nor less than three calendar months.*

1. Persons having hired stocking-frams, unlawfully disposing of them without the consent of the owners. (26 Geo. III. c. 55, s. 3.)

2. Knowingly receiving or purchasing such stocking-frams as unlawfully disposed of. (28 Geo. III. c. 55, s. 3.)

**LVI.** _Fine_ of 100l. or _imprisonment_ with hard labour for any term not exceeding one year, at the discretion of the court.

1. Making signals between sunset and sunrise from the 21st of September to the 1st of April, and between 8 p.m. and 6 a.m. at any other time of the year, for the purpose of giving any notice to persons on board smuggling vessels, whether such persons be or be not within distance to notice such signals. (8 & 9 Vict. c. 87, s. 60.)

**LIX.** _Fine_ of 600l., and the offender to be rendered incapable of holding any office or place under the crown.

1. Judges and other officers or persons demanding or taking any money or other thing of value for anything done or pretended to be done under any Act relating to bankrupts, beyond what is allowed by such Acts. (1 & 2 Wm. IV. c. 80, s. 58.)

2. Masters in Chancery, or persons holding offices in the Court of Chancery, or under any of the officers thereof, demanding or taking any emolument or other thing of value, other than is allowed to be taken for anything done or pretended to be done relating to their offices or employments.† (3 & 4 Wm. IV. c. 94, s. 41.)

**LXI.** _Fine_ of 200l. for six months.

1. Bailiffs, or other chief officers of towns corporative, designedly hindering the election of other mayors, &c. in the same towns corporative.‡ (11 Geo. I. c. 4, s. 6.)

2. Being not bona fide acting as guardians or receivers of silver, buying or selling bullion or molten silver. (6 & 7 Wm. III. c. 17, s. 7.)

3. Persons suspected of buying or selling unlawful bullion, in whose hands such bullion shall be found, not proving upon their trial for melting the current coin of the realm, by one witness at the least, that the same was lawful silver and not current coin, nor clippings thereof. (6 & 7 Wm. III. c. 17, s. 8 in part.)

**LXI.** _Half a year’s_ imprisonment, and ransom at the queen’s will§.

1. Marshals of the Queen’s Bench suffering prisoners indicted for felony, who have removed the same indictment before the queen, to wander out of prison by bail or without. (6 Edw. III. c. 8.)

**LXII.** _Fine_ for any period not exceeding six months, or _imprisonment_ of the offender, if a male, may be put to hard labour, or be once, twice or thrice privately whipped, in such manner as the court shall direct.

1. Maliciously damaging anything kept for the purposes of art, science or curiosity, or as an object of curiosity, in any museum or other repository, which is at all times or from time to time open to the public or any considerable number of persons, either by permission of the proprietor or by payment of money, or any picture, statue, monument or painted glass in any place of public worship, or any statue or monument exposed to public view. (8 & 9 Vict. c. 44, s. 1.)

**LXIII.** _Improvement_ for any time not exceeding six calendar months.

1. Making false declarations under the provisions of the Act for regulating the manner of making sureties of the duties of excise taxes.¶ (50 Geo. III. c. 105, s. 9.)

**LXIV.** _Fine_ not exceeding 100l. and three months’ _imprisonment_.

1. Procuring the consent of more than twenty persons to any petition or other address to the queen or either house of
parliament, for attention of matters establishd by law in church or state, without the previous order of three or more justices, or even a single justice of the grand jury of the county, where the matter arises at the assizes or quarter-sessions, or, if arising in London, of the lord mayor, aldermen, and commons, in common council assembled; or, upon pretence of presentment and petition or other means being inviolate, and by a greater number of people, or at any one time with above ten persons. 

II. Fine not exceeding 20l., or imprisonment with or without hard labour, for any term not exceeding three months, or, fine not exceeding 50l.,

III. Offending against the provisions of the Act for regulating schools of anatomy. (3 & 3 Wm. IV. c. 75, s. 18.)

IV. Fine not less than 20l., and imprisonment with or without hard labour.

V. 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. 1.)

VI. Imprisonment until the offender brings into court him which was the first author of the tale, and, if he cannot find, any other person with which the panel shall accord; or, with any other person, willfully concealing the estate of such person, committed by him, (3 & 11 W. Vict. c. 11, s. 17.)

VII. Fine of 40l.

VIII. Disturbing any religious assembly allowed by law. (1 Wm. & Mar. c. 18, s. 16; 31 Geo. III. c. 92, s. 10; § 12 Geo. III. c. 155, s. 1.)

IX. Fine or imprisonment. (5 Geo. IV. c. 50, s. 61.)

X. Bravery according to the laws. (6 Edw. I. c. 10.)

XI. Illegal distress. (32 Henry III. cc. 1, 2, 3, 4; 8 Edw. I. c. 16.)

XII. Fine and ransom at the queen's will and pleasure.

XIII. Judges or clerks raising rolls, changing verdicts, &c. whereby ensues disbarrement of any of the parties. (8 Rich. II. c. 4.)

XIV. Penalties for persons bolding commissions to compound for the payment of first-fruits. (26 Hen. VIII. cc. 8, 4; 1 Edw. I. c. 4, s. 24.)

XV. Grievious fine to the queen.

XVI. Being or being supposed to be committing impiety, or engaged in any foreign war, or any sum of money, or other business, to the damage of the queen, or any of her crown's dominions, or Papists keeping school or educating youth within the same, whereby, upon conviction, they become liable to perpetual imprisonment; and, for every second and other offences like imprisonment, and to forfeit 12l. to the queen. (13 & 14 Car. II. cc. 4, s. 11 and 12; 1 Wm. and Mar. sess. 1, c. 8, s. 11.)

XVII. Poaching, priests, or Jesuits, saying mass or exercising any other 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. (11 & 12 Wm. III. c. 4, s. 4.)

XVIII. 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 offences 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 offence of forbearing to resort to church is repealed by the Protestant Dissenters' Toleration Acts (1 Wm. & Mar. sess. 1, c. 16, ss. 13 and 16; and 52 Geo. III. c. 155, ss. 4 and 14) in favour of Dissenters who go to some congregation for religious worship, and protestants shall enjoy the same. 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 same Acts, the offence of relieving, harbouring, or protecting an Ran Sous was also punishable as treason.

The above offence does not apply to the delivery of false-currants, or of removing from the land of the lord mayor, aldermen, and commons, held under the provisions of 9 Geo. III. c. 13, for any better supplying the city with London and other fish, to which a large quantity is annually exported. Persons committing this and the next offence may be proceeded against by indictment, or by indictment and on information, and, if on information, by the county court, with a penalty not exceeding £10. 

As to other exceptions see 29 Car. II. c. 5, ss. 10 and 11; 11 W. III. c. 14, § 1; 4 Geo. IV. c. 100, 8 Geo. III. c. 72, and 18 Geo. III. c. 83; (cit. 1 & 8 Vict. c. 92, s. 37.)

By the same act persons who use oaths are declared to be incapable of ever being elected to any of the offices held in the Lord's Day, or to vote for the same.
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 for
religious worship of Protestants 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
were Moravians or Separatists) make an affirmation to the
effect of such oaths. The penalties imposed upon schoolmasters
teaching without licence from the archbishop, &c. are re-
pealed in favour of Protestant Dissenters who take the oaths
of allegiance and supremacy (or, if Moravians or Separatists),
make an affirmation to the effect of such oaths. If, however,
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 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; 3 & 4 Wm. IV. cc. 49
and 82.) Pojish bishops, &c. saying massa, &c. and Papists
keeping school or educating youths, 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. 32. ss. 3, 4, and 13; and 10 Geo. IV.
c. 7, ss. 2 and 25.

Persons committing any of the before-mentioned offences
against the Established Church, may, also, in general, pre-
vent the enjoyment of any such benefits by conforming
themselves to the Church. Members of the Estab-
nished Church are not within the Toleration Acts,
and the only mode, therefore, in which they can escape the
penalties for so conforming, is by conforming to the law.
Neither do those Acts apply to Jews.

There are also two offences, having, however, much more
of a political than of a religious character, which subject the
persons committing them to be adjudged Pojish 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 the Toleration Acts, or, 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.
c. 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.
(20 Car. II. st. 2. s. 2, 5, and 6; 8 Geo. I. c. 6; 31 Geo.
III. c. 32. s. 20; 10 Geo. IV. c. 7. s. 2, 4, and 23; 3 & 4
Wm. IV. cc. 49 and 82; 1 & 2 Vict. c. 77.) Peers and
Members of Parliament are also liable in respect of the latter
offences to many disabilities, to a fine of 500l, in addition
to the penalties consequent on being adjudged Pojish recu-
sants convict. The repeal of the four first-mentioned offences
relating to the Established Church, is recommended by the
Commissioners to Parliament, with a view of making the
criminal law (See their Report on Penalties and Disabilities in regard
to Religious Opinions, dated 30th of May, 1845.) The Com-
missioners also recommend that persons committing the two
last-mentioned offences should no longer be adjudged and
suffer as Pojish 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, re-
lated to the definition and punishment of the above offences,
that is, and the laws as Law and Seed as regards indi-
ectible crimes and their punishments, has been collected
and reduced into one body by the Criminal Law Com-
mmissioners (see their 7th Report), and is thus for the
first time brought with fuller and clearer light to the public at large. Before this reduction the Criminal Law had to be sought for in an
innumerable mass of statutes, reported decisions, records, ancient
and modern, and text-books; and, on that account, could be known
only to a small minority of the learned, and to those engaged in
the practice or administration of the law. The digest so pre-
pared by the Commissioners, and called by them "The Act of
Crimes and Punishments," is comprised in twenty-four
chapters, under the following heads:—

1. Preliminary Declarations and Enactments.
2. Treason and other offences against the State.
3. Offences against Religion and the Established Church
   (including the present the Executive Power of the
   Church).
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 Coinage.
8. Offences relating to the Public Property, Revenue and
   Funds.
10. Offences relating to the Administration of Registration.
11. Offences against Public Morals and Decay.
14. Offences relating to Trade, Commerce, and Public
    Communication.
15. Homicide and other offences against the person.
16. Libel.
17. Offences against the Habitation.
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 Re-
    petitions of Offences.
23. Definitions of Terms and Expressions.
Procedure.

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 to be first done, to an attorney-general, and may be procured from some such magistrate. In order to the issuing of a summons or warrant there must be an information laid on oath: the former may be directed either to the accused himself, or his sureties, or any other person whom the magistrate pleases, and must signify the party to be arrested and the offence which is the cause of his arrest. After a summons duly issued and served, he may be brought to appear according to its directions, or in default the magistrate may issue his warrant to apprehend him. After a warrant duly granted, whether a summons has 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 manner 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, a dangerous felony or tumultuous riot, to arrest 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 to property or persons may be arrested 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 committed to him in view; but (except in the case of one of the metropolitarn police, who may arrest under certain circumstances do so upon a charge made of an aggravated assault [see 2 & 3 Vict. c. 47], not for one committed out of his view.) Justices of the peace, sheriffs, coroners, 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 to put so much thereof as is material into writing. If a prima facie case be made out, the justice is to commit him to prison (unless he be one of the metropolitan police) and the accused is to be brought before a 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, the accused 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 confess the 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 (5 & 6 Wm. IV. c. 33, s. 3). If the accused be brought before two justices in the first instance, they have the like power to bind him to appear and answer to the accused is not bound to plead, the justice may certify that he is of sufficient means and not likely to abscond, or be unable to give security, if the accused be not bound before the second for the commencement of the assizes or sessions at which the accused is to be tried, he is not entitled to an order of discovery in order that he may be delivered without delay or inconvenience to the trial (6 & 7 Wm. IV. c. 114, s. 8).

Before a prisoner can be put upon his trial for any treason or felony, it is necessary that a bill of indictment should be found against him by a grand jury duly returned as some 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 of a treasonable nature, he may be tried either upon a bill of indictment found, as in the case of treason or felony, or upon a criminal information filed against him in the name of the queen. For a prosecution, he may be tried either on a petition or on information presented to the attorney-general, in like manner as in the case of treason in the usual manner pointed out by 1 Rich. II. c. 5, commonly called the Statute of Premunire. This latter mode may, however, be regarded as obsolete.

A bill of indictment must be either so stated as to implicate the Crown, and for 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 are individually aggrieved by the offence, or fill some office which renders it specially 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, indexed '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 be framed upon the first apprehension of the person by the grand jury, their own knowledge that an offence has been committed; but this mode of prosecution is seldom adopted. For further particulars relating to this mode of proceeding, see 31 Car. II. c. 2, s. 7.

A criminal information in the name of the Queen is a suggestion filed on record by the attorney-general or by the queen's coroner or master of the Crown Office, in the court where the accused has been or is an alleged offender. The attorney-general, or, during vacancy in that office, the solicitor-general, may at his discretion file a criminal information. In all other cases it is in the discretion of the Court of 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 its interference. 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 goal 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 attorney-general, or, 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 term or sessions after their commitment, and they are acquitted upon their trial, shall be discharged from imprisonment (31 Car. II. c. 2, s. 7). [INHALATIO CORPUS ACT, P. C.]

When the indictment is found, in cases of felony, the accused is bound to plead and try his cause, and, if the case be tried by the grand jury, to be brought to the bar and arraigned (which is the legal term for calling on a prisoner to answer to a charge of an indictable offence) as soon as convenient after such indictment is found; 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. 18), 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 to be produced against him, and if indicted by any other than the grand jury or the Queen's Bench, a list of the petty jury; but if indicted in the Queen's Bench, the list of the petty jury may be delivered to him at any time after his arraignment, so as it be delivered ten days before the day of trial. (7 Geo. IV. 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 of the indictment, he will be considered to have waived any 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 custody or out on bail, after which he is charged, twenty days at the least, before such session (30 Geo. III. & 1 Geo. IV. c. 4, s. 3), but may traverse the indictment, that is, postpone its determination to the next session. He must, however, before he is allowed to do so, appear personally in the
Queen's Bench, where he may appear by attorney and plead a petty indictment for a misdemeanor, 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 has been committed to await trial, to be tried within ten days before such subsequent session (6 Geo. III. c. 4, s. 5). If the accused, whether in case of felony or misdemeanor, be not in custody nor on bail when the indictment is to be tried, he may, without being indicted in 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 Courts of Quarter-Sessions of the peace of one county; and the superior Criminal Courts of the Counties Palatine; but Courts of Quarter-Sessions and Borough Courts have no jurisdiction with respect to treason or felony punishable by death of in any accused save upon a presentment or indictment in other offences (see 5 & 6 Vic. 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 otherwise directed. As to challenges, whether on the part of the Crown or the prisoner, and as to petty jurymen generally, see JURY, P. C. I may here be observed, however, that the right of peremptory challenge, i.e. of challenging at mere pleasure, without showing any cause, which exists in cases of treason and felony, is one of the common law liberties of the country, which the king cannot alienate without the advice and consent of two thirds of both branches of the legislature. In cases of felony, the power to challenge peremptorily to the number of thirty-five jurors in cases of treason, and to the number of thirty in cases of other felonies, is vested in the king, and exerciseable at the suit of the accused. When twelve jurors are procured free from exception, and have been sworn, or, if Quakers, Moravians, or Separatists, or persons who have been in religious communion with either, are retained by the Crown, they are not to be discharged for the non-appearance of the said jurors, unless there should be a sufficient cause, to which the defendant, the court, or counsel for the prosecution, may object, unless the defendant, by his counsel, shall, upon the trial, after the opening of the prosecution, and the giving of the questions, himself state a sufficient cause, other than the non-appearance of the said jurors, why they have been retained.

In cases of treason or felony, the prisoner may, before the opening of the prosecution, and the giving of the questions, be committed to the keepers of the house of correction, or to the officer of the county, as the law directs, in a manner to prevent his preparing, or engaging in, or procuring the preparation, or engaging in, or procuring the preparation, of any treasonable or felony documents, or to prevent his communicating with any persons, unless upon the authority of the grand jury, or of the court of quarter sessions; and he shall be committed without examination, unless upon the requisition of the grand jury, or of the court of quarter sessions, and the court shall be satisfied that the cause for which he is to be committed is such as is likely to endanger the public peace. The prisoner may, after he has been committed to the house of correction, or to the officer of the county, or to the keeper of the gaol, or to the sheriff, be brought before the court, to be remanded or discharged; and if the court shall think fit, they may 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 juris-
When the jury have agreed upon their verdict, they signify that they are ready to deliver it; and on returning into court for that purpose, their names must be called over, and all twelve must be within hearing when it is given. The foreman 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 the presence of the prisoner: in cases of misdemeanor it may be delivered by the person charged, or by 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 count, or Guilty as to part of the count, and Not Guilty as to the remainder. The offence is charged which includes a lesser crime of the same degree, and the latter only is proved; as where murder is charged and is set at large in open court, and 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 the commission of the offence, and whether he was acquitted on that account; and if they find in the affirmative, the court is to order him to be detained till the queen's pleasure he known; and she may give such order therefor as in like cases the queen has done, and of the same authority: (39 & 40 Geo. III. c. 94, s. 1; 2 & 4 Vist. c. 54, s. 3.) On a verdict of acquittal, or he is discharged by proclamation for want of prosecution, the prisoner is to be immediately set at large in open court, without the payment of any fine in respect of such discharge. (14 Geo. III. c. 20; 56 Geo. III. c. 50; 8 & 9 Vist. c. 114.)

When a verdict of guilt has been returned 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 judgment. In prosecutions pending in the Queen's Bench, however, 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. No. 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 such cases of information filed by the attorney-general, as the government of the crown or crown's attorney-general, may order), 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 six days after the commencemen of the ensuing term, during which time the prisoner may have 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 offence of which 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 convicted, though twenty-four hours after such conviction, denies that he is the person convicted (in which last case a jury is to be impanelled to try the fact), or for some defect apparent in any part of the record, as regards either the jurisdiction or the commission of the offence, or of the 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 he arrested, all the proceedings against him are to be set aside, and judgment of acquittal to be pronounced in his favour; but he may be prosecuted again for the offence of which he is so acquitted.

A new trial may be had on the application of the defendant in all cases of non-capital felonies pending in the Queen's Bench, where it appears to the court that the chargingbond is essential to justice; as, for instance, where the verdict is contrary to evidence or the directions of the judge, or evidence has been improperly refused. The recharge 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 or practice, as where the party acquitted has kept back any of the prosecutor's witnesses, or neglected to give due notice of trial.

A writ of 

terri facies de novo, the effect of which is the same as granting a new trial, may be applied for, where, by reason of the error 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 trial, appearing on the record, the proper effect of the first sentence has been frustrated, or the verdict has become void in law.

Neither new trials nor writs of 
terri facies de novo are granted in cases of treason or felony.

Where a new trial or writ of 
terri facies 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 the same reason, for any material defect as are sufficient to arrest a judgment, and for any material defect in 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 petty sessions, it 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, P. C. and C. S.): whereas it has been pronounced in the Queen's Bench, 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 King's Bench.

In cases of treason and felony it is not in the discretion of the crown to grant or refuse a writ of error: in all other cases the fiat 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 fine or penalty paid and taken on account of such termination of the Writ of Error. (6 & 9 Vict. c. 68, s. 1.)

If the judgment be falsified or reversed, such judgment and the execution thereupon, and all former proceedings, become therefore null and void, and any sentence pronounced 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 be committed to undergo the remainder of his sentence.

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 restitution, where the offender forfeited by his conviction or attaintment, is thereby revoked in him; or, unless where the pardon is by act of parliament, it is the corruption of his blood removed, except as regards those of his blood born after the pardon, all the cases of the consequen-
ces 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 on a substantial justification created by law before the court. 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 statute also 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 at the trial that she is not quick with child, she is to remain in custody until she be delivered of a child or it is no longer possible in the course of nature that she should be so. After her delivery or where such delivery is no longer possible as before, the officer is to continue her in custody until she be delivered of a child, the court, at the expiration of the period for which it has respited her, proceeds to award execution against her. Where insanity is alleged, the court will reprove the pris-

Soner, if found to be a suspensory cause of ex officio inquiry, or if his insanity otherwise sufficiently appear.

Should the execution of a judgment be neither prevented nor suspended, or, having been suspended, should have ceased to be so, it is the duty of the court to arrest the execution and to issue a habeas corpus to the sheriff or other authorised person or his deputy. In capital cases, if the offender, after hanging, be taken down before he be dead, he is to be hanged again until he be dead. As regards the manner in which the various judgments which may be pronounced against offenders are to be executed, the subject is too extensive to be further treated of in an article like the present.

With respect to the expenses of prosecutions for indictable offences, the general provisions on the subject are contained in 7 Geo. IV. c. 64. According to these the court before which any person is prosecuted for felony or the following misdemeanors, such as: false accusation of felony; at-
tempts to commit felony; riots; receiving stolen property; assaults upon peace-officers in the execution of their duty, or upon persons acting in their aid; neglect or breach of duty by persons having any care or custody of the public revenue; illegal proceedings of officers to raise the rate of wages; obtaining property by false pretences or by undue exposure of the person; perjury and subornation of perjury, may, at the request of the prosecutor or any other person appearing on his or her own behalf to prosecute or give evidence, order payment of the costs and expenses incurred by the prosecutor in preferring the indictment, and also the reasonable expenses of the prosecutor and witnesses for the prosecution in attending before the grand jury and otherwise carrying on the prosecution; and also, whether a bill of indictment be preferred or not, may order the rea-
nons expenses incurred by any person by reason of attend-

ance on any such recognizance or subpœna (such attendance, where no indictment is preferred, appearing to be in bonâ fide obedience to the recognizance or subpœna), and, except in cases of misdemeanor, by reason of attending before the ex-

aming magistrate, and also, if the person shall attend before such magistrate in cases of misdemeanor, compensation for trouble and loss of time. Such payments are in general to be made out of the county rate.

It is the purpose of the statute to what principle the selection of the cases of misdemeanor in respect of which the court is empowered to award costs has been made. Other cases might with justice be included; and it may be a question whether, under other circumstances, there is not a case of a new conviction to be ex-
tended to the expenses of the prisoner's witnesses.

Offences punishable on Summary Conviction.

It would be inconsistent with the limits of the present article to give a detailed account of the various offences punishable on summary conviction, in number far exceeding those which are indictable. They relate, however, principally to ale and beer houses, apprentices, petty assaults, the Customs and Excise, distresses, drunkenness, friendly societies, gaming, hawkers and pedlars, highways, turnpike roads, petty thefts not amounting to larceny, malicious injuries to property, pawning and receiving stolen goods, vagrants, vagrants, warrants, and the numerous offences punishable under the Metropolitan Police Acts.

Summary proceedings, except in the case of attempts of the superior courts of justice (which some Courts have been immemorially used to punish by attachment), were wholly unknown to the common law. Their institution appears to have originated partly in the necessity for relieving the ordi-

nary tribunals from the immense burden which would otherwise have been cast upon them, owing to the mul-
tiplicity of new offences of a trivial kind which were yearly committed, doubtless at once arising from the nature of popu-

lation and civilization, and partly in the desire to do more speedy justice in the case of such trifling offences than it would have possibly been had they been made indictable. In the case of indictable offences a party cannot in general, as before
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 indictable would have entailed 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 parliament have been passed to create new offences in the case of the peace or other persons the power to try parties accused of trifling offences without the intervention of a jury. The extension, however, of this mode of proceeding has been always resisted with a saner wisdom.

Where an offence punishable on summary conviction before a justice of the peace has been committed, or is suspected to have been committed, the general course of proceeding is as follows: An information is made but which need not be in writing unless directed to be so by the statute which creates the offence, 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 fact, or profess to be unacquainted with the matter accused of, the de- crust 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 the word 'proceedings' must in all cases be upon oath, notwithstanding the Act creating the offence may authorize conviction on the examination of witnesses, without stating that the same is to be upon oath. So also such examination must be in the presence of the party complained of, where he appears; and generally, all rules applicable to the trial of indictable crimes may be considered as applying to the trial of offences punishable on summary conviction. Such rules are consistent 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 reasons of convenience to the several justices creating the offenses or inflicting the punishment. In some cases a power of appealing to the quarter-sessions is given to the party convicted. [Justice of the Peace, P.C.]

There are also cases of offences punishable on summary conviction before the Commissioners of Excise or persons other than justices of the peace, referred to be made to the statutes on the subject. The principles that hold true in 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 Treatises On the Law of Evidence and On Criminal Pleading; Dickens's Guide to the Quarter-Sessions; by Tailourd; the 4th, 5th, 6th, 7th, and 8th Reports of the Criminal Law Commissioners; the Reports of the Commissioners for revising and consolidating the Criminal Law, on the subject of Penalties and Disabilities in regard to Religious Opinions; and Hilton On the Law of Convictions.

LEASE. A lease, or letting, is sometimes called a Demise (demisio). It is sometimes said that Lease is from the Latin locatio; but as the verb which corresponds to the noun Lease is Leas or Lest, which corresponds to the verb Leat, the verb Leat is akin to the French laisser and the German lassen.

He who lets land is called the Lesser, and he to whom land is let is called the Lessee.

There are various legal definitions of a lease. A lease has been defined to be a conveyance of lands or tenements from lessor to lessee for life, for years, or at will, generally in consideration of a rent or rent reserved. It is that lease by which the lessor conveys to the lessee the leasehold interest in the land demised, and the lessee holds under the condition of payment of the rent reserved. Under this definition, lease would denote a contract for a determinate period, and not a perpetual interest.

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To constitute a lease, it is necessary that the lessor's interest in the lands demised. If a man parts with all his interest in the lands or tenements, the conveyance is an assignment [Assignment, P.C.], and not a lease. The relation of the lessor and lessee is that of landlord and tenant.

The lease has a reversion in the lands which are demised, that is, after the expiration of the lease the land reverts to the lessor. The lessor, by virtue of this reversion, sovereignty, or lord's title, has the power of drawing 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 fealty is always due to the lord.

The ordinary course of lease 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 'demise, grant, and to farm.' These words are derived from the law-Latin expressions 'demail, concess,' and ad firmam tradidit.' 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 of a certain rent, being paid in 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 beans no longer than the time during 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 'demise,' &c., above mentioned, are the proper words to constitute a lease for years: but any words are sufficient, which clearly show 'the intent 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 to make the lease complete, but for reasons of convenience to the several justices creating the offences or inflicting the punishment. In some cases a power of appealing to the quarter-sessions is given to the party convicted. [Justice of the Peace, P.C.]

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tain, in order that the lease may be most beneficial to the landlord and the tenant, and by consequence to the public generally.

It is evident that the cultivation of 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 statesmen who have particular classes of persons enabled or restrained, as to the granting of leases, such as Bishops, Deans and Chapters, and others. [Bennett, P. C.]

The kind of leases which we shall treat here are farming leases, which are granted by persons who 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.

At present a great part of the land in England and Wales is held by large proprietors, and the number of landowners who cultivate their own estates is comparatively small. In many parts of the kingdom the number of small land-owners who cultivate their own farms has certainly been decreasing for some centuries, and they are probably fewer now than in former periods of our history. In England the great subdivision of land has been prevented by the form of government and the habits and feelings of those who have had the chief political power: and the great increase of wealth that has arisen out of the manufacturing and commercial industry of the country is deemed to prevent the subdivision of land and not to increase it. Those who acquire great wealth in England by manufactures and commerce generally lay out a large part of it in the purchase of land; for the ownership of land is deemed to be a man to found a family and to perpetuate it, to obtain social respect and consideration, and also political weight in the administration of public affairs. It facilitates his election to the House of Commons, and if he plays his part well, it may introduce him into due time to the House of Lords, and place him among the nobility of England.

Those who cannot acquire enough to give them political power, nor are anxious to acquire land, are a means of social distinction, and as a permanent investment which must continually rise in value. Thus there is a constant competition among the rich for the acquisition of land, which raises its price above its simple commercial value; and a man of moderate means does not find it easy to purchase land in small quantities and on such terms as will enable him to obtain a proper remuneration for the cultivation of it.

The great mass of the cultivators in England are now tenant farmers, who hold their land either by leases for years or by such agreements as amount to a tenancy from year to year only; and there is the kind of competition among them to obtain land for their own use, that enables him to obtain land by purchase. The consequence is that more rent is often paid for land than it is worth: a consequence of the limited amount of land and of the number of competitors for it. The rent is sometimes increased in consequence, but it enables the landlord to impose conditions which are unfavourable to the tenant and to agriculture, and finally to himself.

Several things are essential to the good cultivation of land, whether it is held by lease or is the property of the cultivator. These essentials are, a knowledge of the best modes of husbandry, adequate capital, and a market in which the farmer may fairly buy and sell all that he wants. Now, in the present state of agriculture in this country, not one of these three conditions exists in the degree which is necessary to ensure good cultivation. The greater part of the land in England, as well as in the colonies, is cultivated under leases or a tenancy from year to year; and the covenants in the leases are often such as to be an insuperable obstacle to good agriculture. The condition then of the tenant farmer, as determined by his lease, is something that should be considered.

Many landholders have several objects in view in letting their lands besides the getting of rent. One of these objects is to maintain their political weight by commanding the votes of the tenant. This is mainly effected by leasing their lands for determinate periods, such as seven, fourteen, or twenty-one years; but by making them very nearly tenants at will, or liable to quit at six months notice, which he grants for his tenant. He may rent a 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 uner-

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 would be if there were 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 way in which they are conducted, to the abnormal 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 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 than a farmer who has no capital and skill 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 leases with as much minuteness and strictness as they do their rent. [Game Laws, F. C. S.] Thus, in addition to getting a rent from the tenant, they may command the votes of his tenant and secure his game. With reference to these objects and certain other imaginary advantages which he purposes to secure by directing the mode of cultivation, the tenant is often bound by numerous restrictions, penalties, and feudal services, which no care on the part of the farmer can prevent him from breaking in some particular, and which no man of capital, skill, and independence from the feudal system can prevent from being imposed. The leases have been printed and circulated. One of them appeared in the 'Leicester Chronicle' for June 28, 1845. This lease prescribes a mode of cultivation which is absolutely inconsistent with good farming. The landlord in such a case 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 all improvements. The good tenant, whether he is capital or not, will act 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 a thing, but in doing it well. These conditions and restrictions, if enforced at all, can only be enforced by constant supervision, and must be an endless source of trouble and dispute.

But leasing 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 with each other. The tenant must cultivate the land and let him use the land from yielding that amount of produce which it would yield under the best system, not only without thereby being impoverished, but with the certainty of permanent improvement. Ignorance on the side of the landlord of his true
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, which makes it different from the letting 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 advice and direction of another man; he trusts to himself. The object of the landlord is to get as much rent as his land is worth, and to secure it against deterioration during the tenant's occupation. The terms of the lease, then, should simply be, the payment of rent, and the observance of such provisions 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 simple condition 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 himself, submits to all conditions in favour of the landlord, which are not inconsistent with his free cultivation, and which shall secure the permanent value of the landlord's property.

Perhaps many landlords who now grant hard leases would agree to less on these principles, and in this way they would 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 his freedom of action.

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 or less retrenchments and modifications from many quarters before such a lease is got into the best form. But it is an object worth the consideration of all persons interested in the cultivation of the land, and the attempt has been made already. Mr. Cobden, who is well acquainted with the Vale of Evesham Agricultural Association, which has been conducted with the purposes 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 it can 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 there are farmers who prefer dependence to the independence of their property, who prefer a landlord to a free farmer and landlord, these are not the men to improve our agriculture; these are the men with little capital, and less skill, who have no hopes of improving their condition, who rely on the temporary employment of their land, and who 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 compulsion 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 defeated by being left in the lurch in his business, the farmer in one part of the kingdom wants something that he does not produce: but it is produced in another part of the kingdom. Both parts are protected in what they produce, that ease and that certainty which shall full the pockets of the farmers by strengthening in what he buys in order that the other may be protected. Thus the legislature interferes with the prices of things. They do impose a tax on foreign produce that comes into the kingdom simply with the view of getting revenue from it; they profess to interfere in order to keep up the prices of certain commodities that are produced in the kingdom. They profess to regulate within certain limits the prices for which the farmer must buy and sell his agricultural produce; they profess to do it; but everybody knows that the corn laws knows that they cannot do it, and never have succeeded in the attempt. But they have succeeded in breeding up a race of farmers, and of landlords too, who believe that their true interest is best secured by a constantly attempting to raise the prices of all agricultural produce, both that which a farmer buys and that which he sells. As matters stand now, we have by his lease directs his tenant how to cultivate, and at the same time reserves the power of walking over his ground when he pleases to kill the game which the farmer must not kill, but which he must feed; a tenant with deficient capital and insufficient skill, and the shackles of a restrictive lease, or an agreement for a lease which constitutes a tenancy from year to year, and a legislature which interferes with prices and shunts the farmer as well as others from buying in the cheapest market whatever agricultural produce he does not raise himself. Then there is a cry of agricultural distress, and when the ablest man in the House of Commons asks for a committee of inquiry into the condition of the farmers, the tenant, those who complain of the distress will not have the inquiry.

It has been shown [Agriculture, P. C. S.] that all duties levied on agricultural produce that is brought into these kingdom, are productive of distress, however much the farmer may profit. He who disputes this proposition is inaccessible to the cogent power of reason. He who admits it, and contends for the system, must contend that on the whole it does more good than harm. But it is a system continually creating agricultural distress, so that the system does not promote agricultural distress. Those who have handled the subject best attempt to prove, and we believe that they have proved, that the system causes no distress. But it is the chief obstacle to improved cultivation of the land, the granting of good leases, the employment of fresh capital in the cultivation of the land, and the employment of agricultural labour. All these are the causes urged by the House of Commons (1845), in a speech, when he moved for a select committee to inquire into the extent and cause of the alleged existing agricultural distress, and into the effects of legislative protection upon the interests of landowners, farmers, and farm-labourers—a speech unequalled for perspicacity of statement, practical knowledge of the subject, clearness of expression, and sound argumentation; a speech which would place Mr. Cobden, if he had not already earned that distinction, among the very few men who have views at once comprehensive and sound enough to entitle them to the honour of directing the affairs of industrious people.

The covenant is a fact, however few they may be, occasional difficulty and dispute upon the expiration of the tenancy. The landlord may often claim more than his due, and the tenant may be disposed to do less. These difficulties are not only serious in themselves, but all the more so in the case of the case of leases which are in the opinion of a House of Commons (1845) to be a vestige of the old feudal system. The old feudal system continued in the case of leaseholds: the system of leasing and occupying land with the expectation of being able to purchase it, was abolished in 1740, but it is still in existence and continues in the case of leaseholds. It has been suggested that in the case of dwelling-houses in large towns like London, some easy mode of finally settling such disputes might be established. In such cases, the evidence of owners is the evidence on which a jury must give their verdict in case of legal proceedings; and it would be quite as satisfactory to all parties, if the evidence that is submitted to a jury, for their judgment, which is to be used against the farmer, is given to the farmer in some uniform manner, and whose decision should be final.

In 1845 an act was passed (8 & 9 Vict. c. 124) entitled "An Act to facilitate the settlement of controversies arising in respect of a lease, or to vest the right to the landlord in a lease, without any further proceedings. The 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 tax officer, in estimating the proper duty, shall be charged a duty to the extent of 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 is signed and sealed by any person other than the parties thereto, so far as the rules of law and equity will permit, if this act had not been made.' There are schedules to the act.
one of which gives, in column 1, short forms of expression
which may be used in place of the ordinary expressions in
leather, which are contained in column 2; and it is enacted
by section 1, 'That whenever any party to any deed made
according to the preceding schedule be bound to perform
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 forms of words contained in column 1 of the
schedule to the act, and shall be considered as if the same
were annexed to the same deed as is annexed to the
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 in compensation for the dif-
culties that may arise from persons using the abbreviated form
in cases where they may not intend them to have the full
meaning which this act gives to them. He who wishes to
secure himself either as landlord or tenant by suitable cove-
nants will do better to express his meaning at full length,
without availing himself of the abbreviations 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 or bodies, are not to exceed twenty-one years, are
exempted from duty. There is also a stamp duty on-agreements for leases. This
is one of the many modes of taxation.

[Lea, P. C. S.]
LEASE, in Scotland. [Tack, P. C. S.]
LEASE AND RELEASE. [Release, P. C. S.]
LEAST ACTION, PRINCIPLE OF. [Action,
Least 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. 57; and under LEATHER, P. C.
p. 55. The various kinds and stages of the leather-making
process are described and illustrated. The present article treats of the subject
of currying and leather-dressing.

In an interesting lecture 'On Tanning and Leather-dress-
ing,' read by Mr. Arthur Aikin before the Society of Arts
in 1830, and published in the fifth 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 followed in its different departments must be exceed-
ingly various. The more remarkable of these processes and the skins, Mr. Aikin observes that among those of oxen, tech-
ically known as hides, those supplied by bulls are thicker,
stronger, and coarser in the grain than those of cows; while the
leather from castrated or castrating bulls are intermediate be-
tween 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 half-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 accoutrements; 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 bear, or wild bull of Poland,
Hungary, and the middle and southern provinces of Russia;
the animal itself being called buffa, whence 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 skin, and are extensively used for the leather. They are
taved (Tanning, P. C. p. 40) for the use of workmen, and
are tanned and_curried for the upper leathrs of boots and
shoes. Aikin states that it was formerly customary, in the sound-
ground, and the middle and southern provinces of Russia.

The leather is then tanned, usually in wads of clay, and
that the celebrated Limnerock gloves were made of this; it is
usually fine and delicate skins of the unicorn calves. The
practice is however, it adds, now almost discontinued, so that
the trade in this kind of leather is entirely superseded by other
kinds, and the saving of which are not now to depend upon peculiarities in the
material, but upon the quality of the skin than upon its original quality.

Leather, which is most commonly of home growth, although Aikin refers to
a considerable supply as coming from the Cape of Good Hope,
vary much in quality. A long fleece, observes our au-
thority, 'always indicates a thin skin; much of the jelly laid
up in that organ being, perhaps, the material from which the
leather is made; and a thin leather is always one which is
distinctive 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 it does so rapidly that it is of wool. sheep enclosures
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, and the remainder are
slaughtered by degrees, and the skin of the latter will be
twice as thick as that of the former.' When simply
shaved, sheepkins are employed for inferior bookbinding,
for leathering bellows, and for various other purposes for which a
cheap leather is required. All the skin-leather, as it is
termed, which is used for whip-hashes, base, aiptous, &c., is
of sheepskin; as are also the cheaper kinds of soth-leather, of
which brushes, gloves, under-waistcoats, 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. Lambs-
skins are often used, especially white or coloured, as such
of goats and kids supply the best qualities of light
leather, the former being the material of the best morocco, all
other, while kid leather, both white and coloured, affords
many of the finest qualities for shoes, boots, leggings, and
shoeskins, are used for making gloves, as moccasins,
leather-dressed. Aikin states that the
Shamoyed leather breeches were formerly very much used,
especially in the army, and that English shamoyed leather was
in high repute, it was used not only in the clothing of our
own army, but by the cavalry of that nation, and of
most of the other German states. During the
Peninsular war it was discovered that the leather of the British cavalry
was seriously affected in wet weather by their leather breeches,
which, being made of genuine skins, contracted, and
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 Prussian
armies, and this change has effected a great decline in this
branch of the leather manufacture.

Horse-hides, which, con-
sidering their size, are thin, are tanned and curried, and
are used by the harness-maker, especially for collars; and occa-
sionally, when pared thin, for the upper leathers of liders' walking shoes. Dog-skins are thick and tough, and make
ecellent leather; but Aikin observes that as the supply is
entirely from the dog of the smaller kind and have been
for several 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 and by tanned rat-skins. Seal-skins produce a
leather which is inferior to the heated leather, but
and hag-skins afford a thin but dense leather, which is used
exclusively for covering the seats of saddles. 'It comes,
Aikin 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 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 tan-
ing, tawing, or shaving, we may here notice some impor-
tant observations on the subject quoted by Dr. Ure, in the
'Supplement' to his Dictionary of Arts ('art, Leather,'
p. 147), from a communication made by Mr. John Lee
to the Franklin Institute, in February, 1814. 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 100 lbs. of perfectly dry hide, which has broken
and removed all the fur, after being kept in
for several years, and tanned, cost not more than
180 lbs. of leather. 'He believes the usual mode of preparing
the hides for actual tanning, called the liming and baking;
or unliming and cleansing, to be a waste of leather;
and that the upper layers of leather are usually done either by steep-
ing the hides in a solution of lime, or by placing them in a
close heated chamber until the epidermis is loosened by
E japonica putrefaction. Sometimes however this
is performed by a process in which the hides are kept
in Germany, and consists in laying the hides in a
jake or pile, covered with tan, to produce fermentative heat. All of these plans, but
especially the two latter, are said to be injurious to the hides.

The term tanning, as used in connexion with the process analogous to that described in Tanning under the term raising, consists in steeping the hides in a solution of pigeon's dung, containing, Mr. Lee says, urates of ammonia, with the addition of the most powerful compounding of ammonia and lime, with urate of ammonia, and very

fermentable animal matter.

Dry hides are often softened by the operation of the fulling-stocks, which has the effect of softening the leather, for which purpose this is done, 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 lining process is injurious to the hair of the skin; and it appears that leather which has been highly limed is loose in texture, weighs light, and wears out quickly.

The subsequent fermentation in the tanning process aggravates the evil ascribed to the lining. This evil is to be avoided in a process which has been adopted in New York, Maine, New Hampshire, and some parts of Philadelp

...
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 the case. And a lump of polish is laid 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 each case are similar to those above, but in the blacking the flesh side is applied to the skin immediately after scoring, by rubbing it with a solution of copperas. A brush dipped in stale urine is then passed over the surface, and an iron slicker is used to make the grain come out as fine as possible. It is then studded with oil, and, when dry, seasoned, or rubbed over with a brush dipped in copperas-water, on the grain, it is perfectly black; after which it is alched with a g r i t t o n e , 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 grainboarding.

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 panels of coach-bodies, of which an interesting description is given in the 'Penny Magazine,' 1835, 'A Day at 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 skin, cut into two pieces, the front-piece from the front of the coach, and the other side, and so on, but made to fit closely in every part to the woodwork without any joints or divisions, and without showing any folds or wrinkles. 'To accomplish this apparently impossible effect,' he adds, 'the skin is very large and of sound quality, and, in every part, as close to the paper referred to, 'first thoroughly moistened throughout and thrown over the top of the coach, the edges hanging down on all sides. The currier then rubs or brushes it over all the roof, the back and sides, and even in every part. He next proceeds to one of the sides, and in like manner rubs and smooths the leather till all irregularities disappear. 'The leather is in that soft and pliable state that it will yield to the movement of the tools, and enable the workman to fit it to every part of the coach with perfect closeness. 'A little consideration,' observes the writer, 'must show that a superfluous 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 raising, or pressing out all irregularities, and in producing a surface sufficiently flat and smooth for the subsequent operations of the painter.' The edge of the leather is cut off triangularly, thus dividing what divides the upper from the lower panels. In many cases modern carriages have the roof only covered with leather, which is laid flat, nailed, and left to shrivel.

Japonised leather of various kinds is also in use, in shoe-making, harness-making, and for various other purposes. Mr. Adams, in his treatise on 'English Pleasure-Carriages' (p. 69), states that what is ordinarily termed 'painted leather' is covered with a ordinarily transparent 'patent leather,' 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 mode as the hides laid before; but the latter are subjected to the heat of an oven at a particular temperature during several hours.' Boots and shoes are sometimes made of thin enamelled leather, and they possess the advantage of never requiring much oiling, being sufficient to remove any dirt which impairs their gloss.

Of the preparation of Morocco and some other kinds of leather which present peculiar features in their manufacture, a few words may not be out of place. From the account of the manufacture of Russian leather, called by the Russians themselves jucen, which is usually dyed red with the aromatic saunders-wood, and is celebrated for being free from any of the above-mentioned defects, it is not only being proof against insects, but repelling them by its colour, 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 ash-lye, then rinsed, fulled, and fermented in a proper steep, 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 over the horse, on both sides. They are then soaked for about twenty-four hours, and then laid in a paste of eye-dirt, in the proportion of 38 lbs. of flour to 200 skins, enriched with leaven. The skins, when taken out of the bath, are left in tubs for fifteen days, and then washed. Being thus prepared for the action of the astrigent or blackening 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 the salix cinerea and salix caule), in which they are laid, for one hour, and then left to soak fifteen minutes. This manipulation is repeated twice a day for a week, after which the tanning infusion is renewed, and the process is repeated on the same skins for another week, after which they are exposed to the air to dry, dyed, and cured with the empyreumatic oil of the bark of the birch-tree, for the preparation of which Dr. Ure, whose account we have followed, gives full directions (Dict. of Arts, p. 779). This oil, to which the leather is indebted for its peculiarities, is applied only to the flesh side, and care must be taken not to prevent its passing through and staining the grain side. Chemovet, having investigated the odorous matter of this oil, has given it the name of cumin oil.

Shagreen, a peculiar kind of leather, or rather of prepared skin, formerly much used for the covers of watch-cases, mathematical-instrument cases, &c., is briefly noticed under that of the leather, to which it belongs, and we also accordingly agree with those of Aikin and some other authorities. From Aikin's lecture, referred to at the commencement of this article, and Hebert's 'Engineer's and Mechanic's Dictionary,' the following account of shagreen or shagreen skin, when being soaked in water and scraped to remove the hair, is further scraped until it does not exceed a wetted hog's bladder in thickness. It is then, while wet and soft, stretched upon a frame, and the strips are attached with horsehair and round seeds of the albus, or goosefoot (chenopodium album). A felt being laid over these, they are trodden deeply into the soft yielding skin, after which the frames are so situated in the shoes, that as the dress is finished, the skin may be shaken out without violence, leaving the skin in a hard horny state, covered with deep indentations. The surface is then rasped or rubbed down with iron tools, nearly to the bottom of the holes or indentations, the skin being during this operation, laid upon a block covered with wool. The skins are then softened, first with water, and then with a warm alkaline ley, and are heaped, while warm and wet, upon each other; and by this softening the depressed parts of the skin rise to their former elevation, forming prominent points wherever depressions had been made by the seeds. The skins are then salted and dyed, after which, according to Hebert, they are finished, but the description of the process is rather short, but very clear, and the finish produced is perfectly hard and smooth. The skins, when to be finished, are laid in a box of shells, and are covered with a mixture of a beautiful green dye is given by soaking the inner or flesh side of the skin with a saturated solution of sal-ammoniac, strewing it over with copper-flings, rolling it up with the flesh side inward, and pressing it with the weight of a box containing about twenty-four hours; in which time the sal-ammoniac dissolves enough of the copper to penetrate the skin with an agreeable sea-green colour: this is repeated a second time, in order to give the colour more body. 'Blue shagreen,' he adds, 'is dyed with indigo, dissolved in an impure soda by means of lime and honey. Black shagreen is dyed with galls and vitriol.' Aikin, evidently referring to a more ornamental variety of shagreen, instead of giving the above directions for dyeing, says that the skin is stained superficially only, of a green colour, with copper-flings and sal-ammoniac, and then dyed; and that the shagreen is then rubbed down to a perfect light, when the points that were prominent, being deprived of their superficial colouring, appear as white dots scattered over, and gradually melting into a green ground. The shagreen thus produced is susceptible of a high polish, and is both beautiful and durable. Great difficulties present themselves in the way of any application of machinery to the dressing of leather, in consequence of the need of a certain degree of leverage, to obtain an action which will work only on different kinds of leather, of different parts of the same skin; yet the great amount of time and manual labour involved in the polishing and graining of morocco and other ornamental leathers, has induced some ingenious men to invent machinery to do this.

Hebert contrived what he describes as the earliest machine for the finishing of leather, for which he obtained a patent, and which had been in use about twenty-five years.
when he published his 'Engineer's and Mechanic's Encyclopedia,' in 1839. This machine consists essentially of a stiff circular 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 graters, which are capable of being applied or removed as needed for the work to be performed. These, as the apparatus revolves, pass over a series of eight tables, circularly arranged, and mounted upon elastic bearers. The skis to be operated upon are laid upon these tables, and the man who lays the skin smoothly on it, and moves it about from time to time, so as to bring every part in succession under the revolving grater, but as no edge of the knife would come in contact with the surface of the ski, each table is further supported by a lever, to one end of which is attached a trestle, on which the workman can place one or both feet. The effect of this arrangement is that while both hands are left at liberty to manage the ski, a greater or less pressure can be given at pleasure by the operator, while, by entirely removing his foot from the trestle, the table may be caused to fall just clear of the rubbers 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 rubbers operate is formed of brass, and adjusted to a shape, and its angle, so as to be levelled off to prevent the rubbers from striking the skin injuriously as they come in contact with it. To obviate the comparatively trifling defect arising from the circular instead of rectilinear motion of the machinery, Mr. Hebert contrived a 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 passed through a series of revolving rubbers; but the serious practical objections to such a contrivance are evident. Hebert did not know whether it had been brought to work with advantage or not, and it is quite possible that even thin skins may be divided into two thicknesses, each of which is capable of being dressed as a perfect skin, have called forth much ingenuity of contrivance. Illustrated descriptions of several such machines as well as the patent or any information given by any one 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 requisite 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 necessarily in small pieces, was only available for the making of glue. By the use of a machine the best portion of the leather, that with the grain side, is cut of a much more uniform thickness than it was before; the 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 him, he covered a cowhide, which he had been at pains to split sheep-skins into three equal parts, one of which, that on the grain-side, might be used as leather, the middle portion 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. 635 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 upon the rollers between them, 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 centres. These axes may be termed a planetary axis, which is a rod passing loosely through holes in the whole series of discs between their centres and their circumference, and so connected with the axis by its ends that they are free to move by the aid of the plane edges of the disc. The 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 upper roller is composed. It is stated that the leather is produced in about two minutes, during which time the knife makes from two to three thousand vibratory motions to and fro. This machine, according to

Hebert, in the invention, of Lieutenant H. P. C. W. In the machine described by Dr. Ure, and in some others, the knife is stationary, 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 axis of the whole, which is horizontal, revolves in the rim of the whole parallel to its axis, and lies very nearly in the same plane with its face, and which, instead of cutting, is merely a cylindrical revolving cylinder, 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 continuous and uniform movement, instead of a sawing action backwards 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 a shape, and its form to be the chief objections to this ingenious contrivance.

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 'Knight's series of 'Guides to Trade,' premising that the subject of his complaint in reference to English leather is likely to be, if it be not already, materially affected by the very great reductions in the price of manufactured leather, especially of the better classes, made by the English manufacturers under the tariff of 1842, and the still further reductions proposed in the government measure now (February, 1846) under discussion. After some remarks tending to prove a great deficiency in the quality and quantity of leather among shoemakers, but even among tanners and curriers themselves, respecting the qualities of leather, Mr. Devlin quotes from a pamphlet printed by himself for circulation among the London manufacturers of leather, to the Board of Trade, in 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; when a greater time and a more honest consideration were paid by both tanner and currier to the production of the highest degree of wholesomeness, surpassing beauty of grain, a perfect blackness and whiteness, a decided firmness, a decided polish, as mere thickness being the only necessary perfection.' 'But what,' he adds, 'can the manufacturer do? 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 by our manufactures being increased, and, likewise, through this circumstance, feeling himself secure of the commands of the home boot and shoemaker, he goes on in his cupidity, hurrying and driving through as much business as he can, safe in his own interests, and never pestered, hurt, and insulted by those complaints which the less fortunate and apparently more reasonable shoemaker is every day or hour under the compulsion of submitting to the consumer, about the leather breaking, tearing, or cracking, 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 manufacturers to excel both in ordinary and in choice leathers, as they confessingly 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 in France, by the French manufacturer, the less would be the objection would be still more glaring; and hence we are often compelled into clausines, to make the coarse and unwhitely that we may produce the serviceable, and so save the pocket of the consumer, and make the upper part of his foot more pleasurable wear.' 'Our roads too,' he proceeds, 'with which we line our boots and shoes, can bear no comparison with the roads of our neighbours; they are in many cases so hard and stiff with the constant tread of other clyder that they bear upon the matter of the skin, and are so scorched on the skin with various chalks and pigments to produce the requisite surface, that the nail or needle in working is continually being thrust into
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 roughens in the air, a shop, and in the hands 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.’ Wax is useful, but, when it is 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 lofty and soft to 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, skin over skin, for a month or two before they are cut; leather in this condition, as the phrase is, fastening, 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.’

Hobert 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, bored into seeds, lampblack, white lead, and pippesary, varied according to the soil in which the elastic hemp is acquired, spattered 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 caoutchouc. Each of these, however, is chiefly intended for the manufacture of patent ties, but is suitable also for covering coach-tops, and for some other purposes.

LEBANO-STAPHYLARIA [Leverworts, P. S. L.]
LEFEBVRE, ANTOINE COTTRIGHT, P. C. S.]
LEFEBVRE, FRANCOIS JOSEPH, Duke of Dantzig, and Marshal of France, was born of humble parents, at Raffach, in Upper Alsace, on the 25th October, 1755. He was preparing for the ecclesiastical profession, but having lost 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 serjeant-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 advantage of a college education. The merit of Mr. Lefebvre’s abilities was 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 3rd of September, 1793, he was appointed adjutant-general; 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 battle of Lammersbach, and in the battle of Giebzig. During the whole of the campaign in Germany and the Netherlands, under Fiegerow, Moreau, Hoche, 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, he placed on its left, and the second, of which he placed on its right, 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 forty thousand best soldiers, and about twelve thousand prisoners. On the 25th of March, 1799, was fought the memorable battle of Stockach, in which Lefebvre acquired fresh renown; with only eight thousand men he resisted, for many hours the attack of thirty thousand Austrians. For these eminent services however Lefebvre 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, sufficiently characteristic of his manner and manner of thought:—‘The definite conclusion of peace,’ he says in it, ‘will enable the country to dispense 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 Lefebvre devoted to their cause, appointed him to the command of the guards of the Legislative Assembly; but, on the morning of the 18th Brumaire (November 9th), 1799, at Bonaparte’s private residence, and cordially co-operated in their proceedings. He was also instrumental in extricating Lucien Bonaparte from his dangerous position in the stormy days of Brumaire. On the 14th of May, 1804, he took his leave of Bonaparte’s private residence, and cordially co-operated in their proceedings.

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 1806 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 were advancing to the relief of the besieged, and Lefebvre was compelled to divide his force, and to throw 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 latter were defeated by the troops of General Czartoryski and General Oudinot, who had been sent by the Emperor to assist them, successfully repelled nine Russian regiments, and a part of the Prussian garrison by whom they had been joined. On the 21st, after a short and severe struggle for a great valley, the Prussian commander General Kalckreuth 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 French kept the peace of 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 he had reached with their help. But always after 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 had saved him, the day before the battle of Leipzig. 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 selected by him 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 cannon 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. [D'Anzi, P. C.] In the year 1808 Lefebvre joined the Persian expedition, and was appointed to the command of the fifth corps of the French army. On leaving, the Emperor had given him directions to keep the Spaniards in check till his arrival; but an enemy's army was marching toward Spain when the enemy were seriously harassing the flanks of his army, he gave him battle, and on the 1st of November triumphantly entered the town of Bilbao. His conduct on this occasion enabled him to serve Napoleon, not only by interfering with his plans of operations, but afterwards present at the battle of Tudela, where he had the command of the cavalry. [Larue, P. C. S.]

In the German campaign of 1809 he rendered himself conspicuous as a brave soldier and an excellent tactician, at the battles of Eckmühl and Wagram, and in the dangerous warfare among the passage of the Danube and the Ticino. He 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 private soldiers. 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 adored for his valor or merceability than by Lefebvre, who acted in April, 1814, at Arcis-sur-Aube (March 20), and at Mont-Mirail (April 14), he displayed the same gallantry as in the more renowned but not more glorious fields of war. For his services in the campaign of 1814 Napoleon greatly influence 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 Debats 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, 1820.

The military career of this distinguished general is 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 evidenced the pleasure of the king; yet to the last he had not lost any of the memory of his husband in the cemetery of Père-la-Chaise. The character of this excellent woman, who was of most humble origin, may be best judged by a trait which Lis Casse praised in him. She was the second wife of a poor tailor, who had three years to serve as a grand officer; and, finally, to obtain the highest grade, which is that of grand cross, he must have served five years as a grand officer.

When a prominent talent in the arts of war appears as 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:—
On all public occasions certain military honours are due to personages decorated with this order, and, at all times, a soldier on different accounts is on more than one decoration. The following salaries are attached to the different grades: chevalier, 250 franes; officer, 1000; commander, 2000; grand officer and grand cross, 5000.

In the formation of this order, as first designed by Napoleon, though of a strictly military nature, the honour 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 honour and devotion to their country. The legion, which was to be composed of men who were not connected 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 military senate, 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 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 Lecien, moreover, to whom the motion had been entrusted, by his impudent 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 reconcile aristocratical feelings, and gradually to introduce the ancient régime; while others, answering the more general observation, that distinctions, when distributed without regard to the constitution should be restricted to military men. Among the representatives of the people, the general expectation of the institution itself was still more strongly contrasted with the Roman senate, where, they felt, the powers of the tabiens, '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 objections was a remarkable proof of his prescience and correctness. '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 a general that I govern France; but because the entire nation believes me 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 intelli-
gence, property, and commerce; what are a quarter of 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 man, 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 that, if a preference is to be awarded to the one rather than to the other, it belongs to the civilian. If you divide society into 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 honours should not be 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, but by a small majority.

The Legion of Honour, though it undoubtedly seemed a forerunner to that new nobility which Napoleon, in after years, created in the form of the Légion d'Honneur, was 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 Caprara, 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 of the Garter, as representative of a church with which France, through his instrumentalities, had been happily reconciled (Thiers, *Hist. du Consulat, &c., b. xii.* [Bonaparte, P. C.])

But a more interesting spectacle was that of the assemblage of the vast army which Napoleon had assembled at Boulogne, preparatory to his intended invasion of England. On the 14th of August, 1804, the festival of his tutelar saint, nearly thirty thousand men were drawn up on the slopes of the large natural amphitheatre, on the western side of the hill, on which is situated the so-called tower of Caesar. An elevated throne was raised in the centre of this theatre, and the soldiers were ranged in four long rows of a circle emerging from this throne as their centre; beyond them was congregated a countless number of spectators. At mid-day the emperor ascended the throne, amid 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 army were to be seen the ancient standards of the republic, the witnesses of the victories of Rivoli, Acreola, and Marengo. In presence of the great, the generalissimo was drawn up in such a manner as to give adherence to the laws of this order and of his country first himself, and afterwards administered it to those around him; then, raising his voice, and addressing the veterans of his army, he continued, 'Citizen officers, you, on the slopes of the hill, are the custodians of the sacred law of your country, 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 militia of the Fatherland. With these words was brought to an end a rapidly moving scene, and this imposing ceremony was concluded by a general review of the whole army, whose ranks defined 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 outlined the fortune of its founder. Its benefits were appreciated by the Bourbon, 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 esteem 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 honor, as such an appellation, as it has been of those of a Ney, a Massena, and a Lannes. It is the erudite of the French nation that, while no other people are perhaps so much under the influence of military renown, it should become the habit of the French nation to distinguish 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 county. His Epitaph says, 'In memory 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 part of the local life, that it is full of life and spirit, and every kind of merit; 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. Time has shown that when he came to determine the distinctions, he 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 followed each other, it would be sure to be noticed, the 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 unassuming man of science, the same decorations which was destined to confer distinction on the commander-in-chief of armies, on princes, and on kings; let us recognize in the creation of these honourable 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 new gratification of vanity, it was to the common soldier, returned to his domestic hearth, at once the pledge of honourable ease and a visible proof of his former prowess.'

The following statement of the rewards which have been conferred since 1796, shows the number of the Order of the Bath, who have 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 details to the lists of the Union of 974, and to the里面 of 975; it being a curious detail in the history of the Order, that this list of the different orders of the Order of the Bath, the entire number of members of all the different divisions of this order were 97,747. We have stated above the number which Napoleon estimated that he had distributed during his reign.

The following detail will show the increase during the reign of Louis Philippe.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Members</th>
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<tbody>
<tr>
<td>1811</td>
<td>9,382</td>
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<tr>
<td>1812</td>
<td>10,686</td>
</tr>
<tr>
<td>1815</td>
<td>19,656</td>
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Thus it appears that there has been an increase during fourteen years of 8,418 members; the diminution in the highest decorations has probably arisen from the deaths of many of the old nobility who had been numbered in all the years of the order, and the number of the order at the year 1844, 29,843 received no pension, and 19,851 drew the salaries attached to the order. The revenue during the year was 7,000,000 francs, about £280,606, and the expenditure 2,807,728 francs, about £277,500. Our information respecting that year is derived from the French newspaper 'Le Courier 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 'Fautes de la Legion d'Honneur,' 4 vols. Paris, 1842 and 1844.

(Bulwer, History, Social, Literary, and Political; Bulwer, History of the Middle Classes; Thierry, Histoire du Consulat et de l'Empire; Alison, History of Europe, vol. iv. v.)

LEGITIMATION. [Bastard, P. C.] -

LEGUMINOSAE, a genus of crucial fruits, from the Islands of the West Indies, the East India, and the Moluccas. The most celebrated is Leech, of Holkham, Thomas William COKE, Earl of. Thomas Coke, Esq., of Holkham, in Norfolk, great-great-grandson of Sir Edward Coke, great-grandson of Sir Thomas Coke, baronet, who was Lord Chief Justice of England, 1727, was appointed by his father, Sir William Coke, of Minster Lovell, in Oxfordshire; and in 1744 Viscount Coke of Holkham, and Earl of Leicester. On his death without offspring, in 1750, the title became extinct, and the estates went to his nephew Weiman Roberts. Esq. (the son of 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 Anson, afterwards 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, and who was the son of his late father, Member of Parliament for the town of Derby, died in 1776; upon which his son succeeded to the representation of the county. In a speech which he made at a dinner given to him in 1833, he stated that, having previously held the position of one of the most influential members in the House of Commons, he was bound to the people of Norfolk, and that he would support the government, and supply the country with the best men. He was elected for the county of Norfolk in 1834, and was returned for the county of Suffolk, and was re-elected for the county of Norfolk at the general election in 1835; but after the dissolution in March, 1842, 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 Martyrs. 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 4110 to 3772 over Mr. Windham, but was unseated by a Committee of the House; upon which he was re-elected for the county of Suffolk, and his younger brother, Mr. Edward Coke, who had vacated his seat for that borough, was also re-elected for Norfolk. At the general 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 1825.

Mr. Coke, though a born steady partisan, 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 to his Majesty, requesting that his Majesty would be pleased to lay before the House of Commons, and 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 20th of March, 1784, 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 been the first to introduce the new system of culture, which he practised in Holkham, in the period of between sixty and seventy years during which he had been in possession, from little more than 2000l. to above 20,000l. From the death of Francis, duke of York and Albany, he was confirmed in the possession of the estate, which he repossessed in 1797.

His plantations were so extensive that the average value of the annual full of timber on his property is stated to have amounted to his death at 2700l., or considerably more than the entire rental of the estate when it came into his hands.

The annual sheep-shearing at Holkham, at which some hundreds of guests were entertained for several days, was probably the greatest agricultural festival in the world.

According to Mr. Coke's own account in the after-dinner speech of 1833 already quoted, he was twice offered a peerage in the very first session that he sat in parliament. More than sixty years after, namely, on the 21st of July, 1827, he was at the Upper House of State, as Earl of Leicester, of Holkham. It is understood that which had prevented his being sooner made a peer was that he would accept of nothing except this earldom of Leicester, which had been announced by his maternal uncle, Mr. Coke of Hatfield, in 1822. Of the great estates which he had inherited, but which had in the mean time been bestowed, in 1784, upon Lord Ferrers, afterwards Marquis Townshend, to whose heirs it of course descends. It was the project of his eldest son, the present Earl of Leicester, to have the title of the same name, with the slight and not very intelligible variation, 'Leicester of Holkham,' bestowed upon a second person. It made no difference to him that the other Earl of Leicester had subsequently acquired a title as well as the name, for the title was still contemporaneously as much Earl of Leicester as Marquis Townshend. The proceeding was precisely the same
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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 Jane, daughter of John Sackville, 1st Earl of Dorset, who died in 1800, and by whom he had three daughters, and many granddaughters and great-grandchildren; secondly, on the 26th of February, 1822, to the Lady Anne Amelia Keppel, third daughter of the Earl of Albemarle, who was then eighty-nine years of age, and who brought him five sons and a daughter. The eldest son, born on Christmas-day, 1822, is now Earl of Leicester.

(Memoir in the Gentleman's Magazine, Sept., 1842. See also 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'GON, a genus of fossil reptiles. (Owen.) One species found in the chalk of Norfolk.

LEIPA (generally called Böhme-leipa), is a town in the circle of Leitomitz, in the kingdom of Bohemia, and in the lordship of Neuschoss, belonging to Prince Kauinitz. It is situated on the river Polza, and has about 6000 inhabitants, who have flourishing manufactories of woolen-cloth, cottons, calicoes, and damasks, and very beautiful earthworks and glass-works. There is a gymnasium and a high school in the town. (Hirschelmann, Handbuch; Stein, Lexicon; Cannabich, Lehrbuch.)

LEIPF., a genus of plants belonging to the natural order Aroidae, and the suborder Lenmeg. It has a 3-flowered membraneous urceolate spathé; the male flowers consist of two stamens; the fruit is recticular and indeliscent. The flowers are sessile, and the rachis of three or four leaves. The flowers appear just below the margin of the spathé. Several species have been described. 'They are all inhabitants of stagnant waters, and are known familiarly by the name of 'duck-weeds.'

(Lubbock, Memoirs of British Botany.)

LEMOINE, FRANCOIS, a celebrated French painter of the eighteenth century, was born at Paris in 1688. He was the pupil of Louis Galleco, early distinguished himself, and, being named a member of the French Academy. Painting: 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 1724 Lemoine visited Italy, where he remained for a year; the artist whose works chiefly attracted his attention were Pietro da Cortona, Lenfreanc, and Bernini. After his return to France he was made professor of painting in the Academie, and in a very few years his reputation surpassed that of all his French contemporaries: Louis XV. appointed him in 1736 his principal painter, with a salary of 4000 francs, in the place of Chardin, who was at this time in Italy. The first of Lemoine's great works was the cupola of the chapel of the Virgin in St. Sulpice, in fresco, which he commenced in 1729, a work of three years labour. His master-piece however is the cupola of the church of St. Sulpice, painted on canvas, painted on the ceiling of the Salon d'Hercole at Versailles, commenced in 1732 and finished in 1736. 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 pituré di maschino by the Italians. The composition is arranged in nine groups, in vigorous and expressive arrangement, colour, and light, and especially in aerial perspective; but it is a purely decorative work, and is effective only from a distance. The parts have little individual merit, and the drawing wants correctness, expression, and descriptive character. Lemoine used on the ground of this picture, the blue vault of heaven, ultramarine to the value of 10,000 francs; it is this which gives the work its fifity-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 habit of his profession and the constant application of his mind to the task of a painter, arising from an insatiable ambition, combined with vexation on account of the decoration of his less successful contemporaries, aggravated to that degree that it amounted to a chronic aberration. He had been destroyed in one of these nervous fits, June 4, 1737, ten months after the termination of his great work at Versailles, and in the fifth year of his age.

Lemoine painted also many easel-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 Jean Baptiste Monnoyer, who died in 1721, and who had the honor of being one of the most famous engravers of his time.

H. S. Thomassin, Silvestre, Lermans, Et. Fessard, &c., loucher, Natoire, and Nonnotte, distinguished painters, were the pupils of Lemoine.

(D'argenville, Histoire de la Vie des plus illustres Peintres; Waterlet, Le Dockeur, Dictionnaire des Arts, &c.; Gault of Saint-Germain, Trois Siecles de la Peinture en France.)

LENCIUSCUS. The reference from Bleak, P. C., to Lencius was a misprint for Lenfant.

LENFANT, JACQUES, was born at Beuze in Bceu, a district of the ancient province of Orléanais in France, on the 13th of April, 1681, and was the son of Paul Lenfant, the Protestant minister of Châtillon-sur-Scine. 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 Jessuel, 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. During his stay at Geneva he obtained the appointment of minister of the French church at Heidelberg, and chaplain to the Dowager Electress Palatine. The invasion of the Franks by the French troops, under Marshal Turenne, in 1690, compelled him to leave Saumur, and he was appointed minister of the French church at Heidelberg in 1688, and was settled at Berlin. The fear of meeting his countrymen arose from having rendered himself conspicuous to the Jesuits by two letters which he had written against them, and which he wished condemned. He was entitled 'A Preservative 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 reigning minister of Brandenburg, Prince Leopold, the King of Prussia, who knew Lenfant by reputation, appointed him to that church, where for upwards of thirty-nine years he performed duty. In the year 1705 he married Mademoiselle Montfeuil, the sister of Madame 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 councillor of the high constabulary. 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. Lenfant was a man of great learning and much erudition, and enjoyed the perfect health, on the 29th of July, 1728, and he died on the 7th of August following.

His disposition is represented to have been amiable, and his manner unassuming, and he was always in the habit of speaking blunt and little. Though a most volun- tuous writer, he was fond of society, and opened himself without reserve to the confidence of his friends. He is said to have had few personal enemies, which may be readily be- lieved, for his character is universally described as remarkable for its disinterested charity, and for the exercise of the peacible 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 calm than energetic. His varied talents and the depth of his learning may best be judged of by the study of the numerous 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 lost for the most part of Joubert's [Jouber] beauty and eloquence than that of Saurin [Sauve, P. C.]. The eloquence was more pure, and the diction more chaste. In one respect especially he is far superior to any of the French Protestant writers, and that is in the bold and open manner with which he set his foot on the bosom of the Church Germanique,' 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.
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Leonard's first work, which appeared in 1683, was a review of one of Bruyas, who, though a celebrated French dramatist, has written several theological works in defence of the Roman Catholic faith. In 1688 he published a translation of a selection from the letters of St. Cyril, in 1690, a defence of the Hildebrand cælianch, which is generally annexed to his 'Preservative,' &c., a work we have before alluded to; and in 1691, a Latin translation of the celebrated work of the Pope Melchisedech on 'Research after Truth.' His life, like that of his predecessors, is generally divided into two parts, to which the arguments in it are drawn from the Latin dissertation on that subject of Spanheim. It is said, however, that, in after life, Leonard Melchisedech acknowledged the absurdity of this section. [Joan, Pops, P. C.] In 1708 he published in Paris, on the Greek edition of the 'New Testament,' by Mill, which are in the 'Bibliothèque Choisiot' of Le克莱, vol. xvi. The following works afterwards appeared in succession: 1. Réflexions et Remarques sur la Fortune du Père Martyr, avec un Juif; 2. Mémoire Historique touchant la Communion sur les deux Espèces; 3. Critique des Remarques du Père Vawa; sur les Réflexions de Basle touchant la Politique; 4. Réponse de Mons. Lenfant & Mons. Daritis au sujet du Socinianisme. The above short works are to be found in the 'Nouvelle de la République des Lettres,' a review in which Leonard often contributed frequent articles. 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 severe criticized. In 1720, in conjunction with Boussoube, he published a translation of the New Testament, with explanatory notes, and a long and most learned introduction. It is by this work, perhaps, that he is best known. [Census, xvi.] We shall now briefly mention the most important of his productions: 1. Poggiana; or the Life, Character, and Maxims of the celebrated Florentine writer Poggio, Amsterdam, 1720; 2. Recherches sur les Arts; 3. Histori de la Syrie, d'Egypte, et de la Communion, during the interval between it and the Council of Constance; a learned and most accurate work, written with sufficient impartiality, 1724; 4. A Volume containing sixteen Sermons, on different Texts of Scripture, 1728; 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 1729; 6. A small volume of Remarks on Gisbert's Treaties on Falsit Eloquence. The last work of Lenfant is one which has greatly added to his already high reputation. 'The History of the Wars of the Huns, and of the Council of Basle,' 1728; but the labour which the composition of it occupied the author for many years collecting materials for this valuable history, and had access, through the influence of the King of Prussia, to the archives of the corporation of Basle. The principal defects of the work are best known to have been taken from a memoir annexed to the above work.

LENTIBULARIE. [LEN'TIBULAR.'E. P. C.] LENTIBULARIE. (from Latin, 'a lion,' and 'a tail,' the tail.) A genus of plants belonging to the natural order Laliaceae. The anthers approximate in pairs, with parallel colls and naked valves. The upper lip of the corolla is nearly flat, the lower one trident, with the middle lobe oblanceolate. The calyx is tubular and 5-toothed; the nectary truncate.

L. cardua., Motherwort, is a bitter herb, with a pungent unpleasant smell. The stems rise from 2 to 3 feet in height; these are quadrilobed, and the leaflets are serrate. 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 lanceolate and acuminate. The flower-cluster, or the spikes, are usually 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 not very decided; it is more especially used for coughs, or heartburn, are now disregarded: from being used however in the last complaint it derives its name. It has been extolled by the Russians as an antidote to canine madness, and bees are said to have eaten the fruit. [Thunb., p. 390; or, p. 383.]

L. marrubastrum has elongated pubescent branches, oblong ovate deeply-toothed leaves, the calyx nearly glabrous, and the corolla small, white or pale-red, and shorter than the calyx; the petals, which are subulate, spiny, and diverging. It is found in waste places throughout Europe and Asiatic Russia. There are eight species of Lepidium 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 open ground, 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 disciple. It is native in the south of Europe from Spain to Tauria, 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 Cardamomum of this genus. It has orbicular pods, variously cut and winged leaves, the pods being flat, and occasionally attached to 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 found, has the leaves 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 foot is sufficient for a bed or four feet square. 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 covered with a cloche or a frame 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 of Dioscorides, 2. 203.

L. campestris has downy leaves, the upper ones toothed, the lower ones oblong and narrowed into a foot-stalk, the stem leaves lanceolate, sagittate, and amplexicaule. It is distinguished from the other species by the pouch being ovate, rough, and covered with minute scales, notched and rounded at the end, the style scarcely longer than the nutch. It grows on gravelly and dry fields of Great Britain.

L. sativum has ovate lanceolate leaves, serrated or entire; the pouch is oval and downy. It has numerous small flowers in compound leafy pedicled clusters. It is a native of Europe, and occasionally found also of Alger; is a prevalent plant about the sea. It has a very hot biting taste, and has been used in stead 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 sets as an emetic. Fras believes this to be the Epilobium of Dioscorides, 2. 147, although it is usually referred to the Brasioid ciretica. It is also the Lepidium of Pinny, 20. 17. 19. 2.

The green-house species will thrive well in any kind of light soil, and are readily propagated by cuttings planted under a hand glass; or by seeds. The hardy annual species, 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 as ornament.

[Don, Gardner's Dictionary; Bahinton, Manual of British Botany; Fras, Synopsis Flora Classica; Burnett, Outlines of Botany.]

LEPIDOPTERAE [LEP'IDOP'TER.'E. P. C.] LEPIDOPTERAE. (from Greek, 'a scale,' and 'to bear,' bears.) A genus of fossil gemod fishes, alpercant in the oolithic strata. [Agassiz.]

LEPIDOPTERAE. [TANTHOIDES, P. C. S.] LEPIDOPTERAE. (from Greek, 'a scale,' and 'to bear,' bears.) A genus of fossil gemod fishes, occurring in the carboniferous and oolithic strata. [Agassiz.]

LEPTENA, a subdivision of the great family of fossil
LEWIS, BRACHIOPODA, proposed by Dalman to include species which Mr. Sowerby named Producta. Its use is at present more restricted, and has become rather indefinite. Leptatina lata of the Silurian system may be regarded as a frequent type. They are intertidal, living in the sand and crevices of rocks, and are common in north-western Europe.

LEPTITIDAE, Two-winged Flies (Diptera), of the division Tanytarsinae in Latreille's arrangement. They are remarkable for the habits of their larvae, which excavate funnel-shaped chambers in the sand, and secluding themselves at the bottom, lie in wait for their prey. When an insect falls into the pit the larva of the Leptesia suddenly seizes it, and clasping the body of the insect injects the juices, after which it flies away the carcase. Leptocaphehalus, a remarkable fish of the El tribe, discovered on the British coast in Pennant's time, and since observed in the Mediterranean. The Leptocaphehalus Merriani is a small, slender, and compressed animal, as thin as a piece of tape, and at first sight resembling a marine worm. The head is extremely small and short, the eyes large, the jaws furnished with numerous minute teeth; the pectoral fins and gill openings very small, and the anal and dorsal fins connected with the tail. The outline of the body resembles that of the Lancelet (Branchiostoma); but the organization of the Leptocaphehalus is that of a perfect fish. Mr. Yarrell describes the verterbrae as having no spiny processes, nor living among seaweed.


LECOT, PIERRE, a French architect of the sixteenth century, of whom, however, nothing is distinctly known, but he is generally supposed to have designed and commenced, together with Daumas, the Palais Royal, the present avenue for Henri IV. and Henry II.; the exact time is a matter of uncertainty. Lecot was born, according to some accounts, about 1515, and he lived to the age of sixty; other accounts give the date 1518 or 1517, as the years of his birth and death. He erected the southern and western sides of the quadrangle, but all that now remains by Lecot is the western side, facing the Tuileries, known as the Vieux Louvre; it contains the hall of Justice as the residence of the Dauphine, as well as the Dauphine's Saloon, and the large room in the south wing, known as the Salle des Caryatides, with the modern name of Salle des Caryatides.

Lecot's style and services to architecture have been the subjects of various speculations; but they are all extremely vague, and amount to very little. By some he is supposed to have been the first to abandon the old irregular Gothic, and to have introduced the Italian style into France; but this was done by Italian artists themselves, several of whom were employed by Francis I. long before Lecot could have attained anything like mastery in his art, or even maturity of years. Fontainebleau is an instance, in which Serlio, Primaticcio, and others, as well as Lecot, have been supposed to have had a share. Lecot is said also to have designed the "Fontaine des Innocents," attributed by some to Goujon, the sculptor of the nymphs of the Fontainebleau, who was Abbot of Cluny or Clugny, and a canon of the Cathedral of Notre Dame at Paris.

L'ESPINASSE, MADEMOISELLE, the name of a lady much celebrated in the Parisian literary circles soon after the middle of last century, was born in 1782. She is supposed to have been the illegitimate daughter of people of rank. She was employed to read and converse with Madame du Deffand in her blindness; but being ambitious, well-informed, and eloquent; she obtained, with much of what is said, she attracted the interest of the circle surrounding Madame du Deffand to an extent which greatly displeased that lady. She dismissed Madeleine, who had the boldness to plan, and more than once, even in the presence of what is said, she accomplished a high matrimonial alliance, and in one instance induced the relations of a noble Spaniard on whom she had made an impression to allow her to return to France, by promissory letters of credit, which she demanded attempts to establish the truth of this, and the date of its occurrence, as well as the probable situation of Madeleine, in her health. Morlot, the uncle-in-law of Marmontel, however, in his Memoires throws doubt on this story. She died in 1776, to the great grief of D'Alembert, whom she had long

198 mortified by not returning his affection. Three volumes of her love-letters, besides numerous and very ardent eloquence, were published in 1809.

LETTERS, CREDITS. [CREDIT, LETTERS OF P.C.C.] LETTERS, THREATENING. [THREATS, P.C.] LEUCISCUS, a genus of fishes of the family Cyprinidae, distinguished by having short and soft anal dorsal fins, and a mouth unfurnished with barbules. There are many species, and are common in brackish and fresh waters.

Those best known in Britain are the Roach (Leuciscus rutilus), the Dace (Leuciscus vulgaris), the Chub (Leuciscus cephalus), the Bream (Leucis ceus argyropterus), and the Minnow (Leuciscus phoxinus). More rare are the Grasse (Leuciscus tissotii) and Dace (Leuciscus idus) which is doubtfully recorded as a native of Scotland. Most of these fishes are sought after by anglers, either for the sport they afford or to be used as bait for pike. None of them are very excellent as food. The roach and chub have been known to attain a weight of five pounds.

The scales of several of these fishes have been used in the manufacture of artificial pearls. 'On the inner surface of perch, dace, bleak, whitebait, and other fishes,' writes Mr. Yarrell, 'is found a silvery pigment which gives the lurethere those fish appealing. The scales of the Roach, therefore matter thus afforded to imitate, artificially, the oriental pearl. When this practice was most in fashion, the manufactured ornaments bore the name of patent pearl, and the Roach was the most valuable of the species, and the most vogue. It present it seems confined to ornaments attached to combs, or small beads arranged with flowers for head-dresses. So great was the demand formerly at particular times, that the price of a quarter's weight of Roach scales was 12l., and in one month the trade was many times repeated. The Thamse fishermen gave themselves no trouble beyond taking off the scale sides, and throwing the fish into the river again; and it was the custom for bakers, regularly, to buy in scale sides, which were used to make funnel-shaped, soft rounds for the head-makers with the scales. The method of obtaining and using the colouring matter was, first carrying off the slime had dirt from the scales by a run of water, then soaking them for a time, the pigment was found at the bottom of the vessel. When thus produced, small glass tubes were dipped in, and the pigment injected into thin hollow glass beads of various forms and sizes. These were then spread on sieves and dried in a current of air. If greater weight and firmness were required, a further injection of wax was necessary. Of this pigment, that obtained from the scales of roach and dace was the least valuable; but it was found that from the scales of the roach there was the greater numbers; the whitefish afforded the most delicate and beautiful silver, and obtained the highest price, partly from the prohibitory regulations affecting the capture of this species fixed by the laws of transmarine and the royal decomposi-

(Les tory of British Fishes, vol. i.) LEVANT COMPANY. In 1681 Queen Elizabeth granted to a company the exclusive right of trading to Turkey. This was the origin of the Turkey or Levant Company. Its exclusive privileges of trade extended to the dominions of the Grand Seignor, whether in Europe, Asia, or Africa. Factories were established, and the company was at the cost of supporting an English ambassador at Constantinople, and consuls at Aleppo, Smyrna, and other places. Adam Smith speaks of the Turkey Company in his time, seventy or eighty years ago, as 'a strict and oppressive monopoly.' The Turkey Company provided no ve. LEWIS, MATTHEW GREGORY, a writer of novels, poems, and dramatic pieces, was born at London on the 9th of July, 1775. His father was deputy-secretary-at-war, and was John Combe, a former member of Parliament. Lewis studied at Christ Church, Oxford, and afterwards lived for some time in Germany. There he became acquainted with Goethe and his followers, and imbibed the mysterious and almost magical spirit of Germany. He afterwards settled in England, and resided there for some years. When he was nineteen years old, he wrote a successful comedy, called 'The East Indian.' The novel by which he is chiefly known, 'The Monk,' was published in 1796; and he has since written many others, showing a skillful employment of supernatural and mysterious agencies, and the display of horrors, it is, perhaps, unrivaled in the English language. A considerable portion of its details are
to the operations of the lustful passions on the character 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 inhumanity of his several crimes, so popular with 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 to prevent the publication of this book, which enlarged the author's fame. At that time it was rather favourable to the success of a work of genius that its morality was not perfectly pure, and Lewis had the satisfaction of being a most popular writer, and the following passage from his poem, as represented in his published letters, is singularly at variance with that which might he derived from the study of his works. He appears to have been good-hearted, 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 husband. 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 wrought with the most humane effect. He regarded the slaves and those in the neighbourhood of his estate. His poetical pieces, including 'Alone the Brave,' 'Bill Jones,' &c, are well known: they are distinguished by the fluency of their style and a noticeable closeness of style. He writes as they narrate horrible and tragic incidents. There is, however, in all his writings, a tone of barbarous and exaggerated taste. In 1812, he introduced to the stage the drama of 'Eumorph the Tartar,' which is said to have had much influence in creating the taste for gorgeous pictures, from which the British stage has for some years been struggling to relieve itself. Lewis died at sea, on the 14th May, 1816, when on the way home from a visit to the Continent. (Life and Correspondence of Matthew Gregory Lewis. 8vo., London, 1839.)

LEYDEN, LUCAS VAN, a very celebrated old Dutch painter and engraver, was born at Leyden in 1604. He was first instructed in the arts by Hugo Jacobz, his father; 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 discontinuity a picture of St. Hubert, in 1606, for a citizen of Leyden, the name of Lorhent, who was so astonished and gratified at the excellence of the work, that he paid him twelve guilders therefor. It was cut by Oost, but it doesnot doubtless a very large sum for a picture. Some of Lucas's early engravings are highly prized by print-collectors, and recounted among the greatest rarities of their class: they owe their high value, in a great measure to their peculiar circumstances of their origin, than to any intrinsic merit they may have. They are better as engravings than as works of art. Vasari speaks highly of the prints of Lucas d'Olanda, as he is called by the Italians. He excelled in aerial perspective, but he was far surpassed by his two contemporaries. Albert Dürer and Marcantonio—in correctness of drawing by the latter, and in execution and in drawing by the former. Albert Dürer 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 man, and is a native of Leyden. This visit was paid during Dürer's journey through Holland. Flanders, and Brabant, for the sake of becoming acquainted with and seeing the works of their various painters. The entry above quoted from the pocket-book of Albert Dürer, fixes the date of the meeting of these two great masters of Dutch art. Mander, who says that Lucas made it when he was about thirty-three years of age, which, according to his own date of Lucas's birth, 1494, would be in 1527.

The artist was a man of very slight and delicate body, and he was clad more like a prince 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 this indisposition that he had entered had endeavoured to poison him, and he added to his malady by indulgence and debauchery. He allowed his mind to fall into such a morbid state that his friends for a long time thought he was insane, and a painter, who had been in 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 1533, aged only thirty-nine.

Lucas's pictures are esteemed as they are in the old Flemish style, but are among the best works of that school. They are earnest, expressive, 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 represents a 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 1529. There is a picture of Lucas at Wilton House, and another at the Liverpool Institution. Mr. Rogers, the poet, possesses a pen-and-ink drawing of the artist, done by Cusack in 1649, and in the possessions of the prince 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 Eulenspiegel, after the rarest engraving 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 ducats; it is about six and a half inches high and rather better than five wide, and represents a man playing the harpsichord, with two children on his back, followed by a woman who is also carrying a child, and is leading an ass burdened with two panniers in which are three other children; the whole family is preceded by a small figure dressed in a coat, 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 Eulenspiegel; it was engraved in 1620. Bartch, who published a distinct catalogue of the prints of Lucas van Leyden, describes 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 toutes les Estampes qui forment l'Oeuvre de Lucas de Leyde, and Peintre Gravreur, vol. viii.; Huber, Geschichte der Kupferstecher-kunst; Van Eynden and Van der Willigen, Geschichte der Vaterlandleute Schilder-kunst, &c.)

LIEBEL, 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 enacted—1. That in any action 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 at such time as in the said section is recited, he has made or offered in writing, and that at such time as the section mentions he inserted in such newspaper or other periodical publication a full apology for the said libel, or made such other apology as in the said section is recited.

2. 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 that such libel was inserted without action of law, in a newspaper or other publication, and that at such time as the section mentions he inserted in such newspaper or other periodical publication a full apology for the said libel, or made such other apology as in the said section is recited.

3. 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 propose to publish, and shall print or publish, a libel upon any other person, and shall either 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 or any valuable thing from
such or any other person, or with intent to induce any person to confer or procure for any person any appointment or office of the court shall, on conviction be liable to imprisonment for any term not exceeding three years. This enactment does not in any way affect any law as to the sending or delivery of threatening letters or writings. (Threats and Treason, p. C. C.)

§ 4. enacts, That if any person shall maliciously publish any defamatory libel, knowing the same to be false, on conviction he shall be liable to two years' imprisonment, and to pay such fine as the court shall order.\[1\]

§ 5. enacts, That if any person shall maliciously publish any defamatory libel, on conviction he shall be liable to fine or imprisonment, as the court may award, but the imprisonment is not to exceed one year.\[2\]

§ 6. makes an important change. It enacts, That on the trial of any indictment or information for a defamatory libel, the defendant having pleaded such plea as in this section is afterwards mentioned, the truth of the matters charged in the manner is required in pleading a justification to an action for defamation.\[3\]

§ 7. enacts, That when on the trial of any indictment or information for a libel, the plea of Non judicium est, or Guilty, evidence shall have been given which shall establish a presumptive case of publication against the defendant by the act of any other person by his authority, it shall be competent for the plaintiff to prove that such publication was made without his authority, consent, or knowledge, and that the said publication did not arise from want of due care or caution on his part.\[4\]

§ 8. enacts, That in the case of any indictment or information by a private prosecutor for the publication of any defamatory libel, if judgment be given against the defendant, he shall be entitled to recover from the prosecutor the costs that he has sustained in the prosecution of such indictment or information; and that upon a special plea of justification to such indictment or information, if the issue be found for the prosecutor, he shall be entitled to recover from the defendant the costs sustained by him by reason of such plea.

This act does not extend to Scotland, § 10. As it was doubted whether or not it did extend to Ireland, this act was extended to Ireland by § 8 & 9 Vic. c. 75.

Defamation and libel were punished among the Romans. The oldest extant rule about defamation and libel is contained in the fragments of the 'Twelve Tables,' which punished both slanderous words and libellous writings. (Cicero, De Repub. De Officiis, C. 33.) The penalty was that the accused should be punished by a fine of six talents (in the Roman sense of that term), and it appears to have been death. Libellous writings were generally denominated 'famosa carmina' and 'nulla carmina.' In course of time the Praetores of Rome were allowed to impose the old law, or a penalty on those who used such. The praetor allowed an action for slander which was against 'boni mores' (Dig. 47, tit. 10, s. 15); and against 'boni mores' means, that which was disapproved of by the community, and tended to bring injury or odium on the person against whom it was directed. 'The technical word for this kind of slander was Convicium, which properly meant something said to a man's face that was injurious; but the commentators on the Edict laid it down that there might be Conviciun even if the person against whom it was directed was not present. Conviciun in fact was personal abuse which tended to damage a man, and was said with circumstances of great publicity. But the Praetor's Edict extended to other cases, and allowed an action wherever a man had done or said anything which injured a person's character. This general clause included libellous writings, and many other things, such as certain modes of solliciting women's chastity, and addressing them in obscene language. The penalty in all these cases was a sum of money assessed by Reperptores as damages.

Under the Imperial government the term 'liber famosus' often occurs: it signifies any writing in prose or verse which tended to injure a man's character (ad infamiam aliæque). The offence consisted in writing the libel, spreading it about or giving it to another. The punishment was to lose things (dolo malo); it made no difference whether the libel was anonymous or had a false name to it. The penalty was (according to some law, the name of which is not known), that the libeller, if convicted, became intestate, that is, he could not make a will or be a witness to a will. (Dig. 28, tit. 1, s. 16.) A senatus consultum extended the penalties to printing false books and pamphlets, but not writing, but only marks which were of a like tendency; this must mean drawings and caricatures, such as are now published in London. Everything therefore which tended to the 'infamia' of a person, even in the nature of untruth, was liable to such a penalty. If a man was mentioned or not mentioned, provided the person intended was clearly pointed at by such writings or drawings, were punishable offences; and writer, draftsman, and all concerned were liable to the legal penalty.

This legislation seems to belong to the Imperial period, though it was not intended to protect the emperor only. Augustus commenced this legislation (Sueton. Octavia, 55), and precision this device was used in the trial of a chief officer of Roman Caesar, like other high personnages in modern times, were the objects of pasquinades and various kinds of compositions which were intended to satirize and make them ridiculous. The penalty of the law of Augustus is not certain; but in later times various Senatus consults increased the penalty to Deportation or perhaps only reeligation. If the author of a liber famosus had been punished in a criminal prosecution (Judiciwm, libellum, the injured person might still have his action, if he was mentioned by name in the libel. (Dig. 47, tit. 10, s. 6.) But if a man libelled a guilty person (nocens), it was considered equitable that he should not be subject to penalties for his error, as this would be an evil-doers ought to be known, and it was expedient that they should be known.' Compare the 6 & 7 Vict. c. 96, § 6.

The 'libri famosi,' or 'libelli famosi,' of the Imperial period, signified anonymous writings, which contained a charge against some person, and were either sent to the Caesar or to some magistrate, or put in some place where they might be found, for the purpose of casting injury on the person accused. This is the only signification of the expression 'libelli famosi,' in the Thedosian and Justinian codes. Constantine the Great declared that such charges should not be prejudicial to any person, and that such writing should be burnt when the author was unknown. If the author was discovered, he was punishable even if he could prove the truth of the matter contained in the writing. Other constitutions on the same subject were made after the time of Constantine.

(Rein, Das Criminalrecht der Römer.)


LIBELLULA, the genus of insects which includes the well-known Dragon-Flies. It belongs to the order Neuroptera and to the section Subdiptera in the arrangement of Latreille. The dragon-flies are often called 'Libellulas' by naturalists. The dragon-flies are generally divided into two genera covered by the labrum and labium; their tarsi are three-pointed; their wings are equal; the posterior extremity of the abdomen is furnished with hooks or peculiar appendages. The size of these insects varies from 2 to 3 inches. They fall into various families and are very useful to the farmer, as they have various beneficial results. They are injurious to many useful insects, and are a period of activity and locomotion. They are then furnished with an extraordinary mask formed out of that part of the head which replaces the lower lip, and by which they cover the jaws and the whole under part of the head. They use it to aline and seize their prey, projecting it at will. When perfect insects, they become inhabitants of air, and are endowed with extraordinary power of flight and precision of movement, performing astonishing evolutions. Their habits continue as ferocious as they were before. When taken and imprisoned, they have been known to devour their own bodies! Several valuable monographs have been published on these interesting insects. Monographie des Libellulides d'Europe. 61 species are described, arranged under the genera Libellula, Cordulia, Linnea, Onychophorus, Cordulga, Orthoptera, Eborus, Anura, Coleoptera, Lepias, Sympron, and Atraphates. (In the chapter devoted to the modern Classification of Insects) the genera of Libellulidae inhabiting Britain are grouped under two sub-families, Libellulidae and Agrionidae. The following table exhibits the chief characters of the British genera:—

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[1] Dig. 47, tit. 10, s. 10.
[2] Dig. 47, tit. 10, s. 15.
[3] Dig. 47, tit. 10, s. 16.
[4] Dig. 47, tit. 10, s. 17.
[5] Dig. 47, tit. 10, s. 18.
[6] Dig. 47, tit. 10, s. 19.

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by the circumstance of his becoming free that he became a citizen, though positive law, as among the Romans, might limit the degree in which he thereby obtained citizenship.

Corveks, P. C., says that the difference between freedom and slavery was not based on the idea 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 his lord; he sold himself to the master: he still owed together with others the duty of perfect obedience to an individual monarch or tyrant.

The words liberty and freedom, as political terms, have always been used to express the 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 a political sense, is applied to nations in which the mass of the people have no tolerable 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 constitutional rule under any other form of government. This is the case even with free commonwealths, of which political liberty is derived from the very formation of a nation, 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 free commonwealths are distinguished is this: the sovereign power is not in the hands of one or of 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 people. In certain nations, 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 of government or a republic. Liberty is a species of democracy, is 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 which they consider to be peculiar to a state governed by a monarch. 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 an historical one. Man is naturally a solitary being, and nature is not due to the want of political liberty; and it is said, arises from the want of government. 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 unalienable 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 Liberty appears as a thing distinct, 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 title to liberty. It is 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 free negroes, mulattoes, and still slaves; and they 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.

The Republican promise 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 offspiring of Revolution, is often premature, and always insecure; so 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 an anarchy, of which all things is most intolerable.

The words Liberty and Equality often go together, and each is in some 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 the power of the one individual some will be richer, 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 polity, which polity, so far as it is consistent with the universal good, secures to every individual 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 us as large a number as it can, consistently with the universal interest, an equal share in the sovereign power; but no polity 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 1789 contains the words 'free,' 'equal,' 'rights,' 'liberty,' and many others, all of which are used in a sense remote from precision as the most confused understanding could suggest. This strange sample of nonsense has been examined and dissected by Bentham in his 'Anarchical FALLACIES' (Bentham's Works, part vii, Edinburgh, 1823).

The word Liberties is often used to express those particular constitutional principles or fundamental laws by which the political liberty of a nation is secured. If the British parliament wishes to be held in the right hand, or the Habeas Corpus, such an attempt would be called an attack on the liberties of Englishmen.

LIGAMENTS, ANAT., F. C.

LIGAMENTS are bandages, and organs by which the various articulations of the animal body are held together.

[ARTICULATION, P. C.] They are generally very strong membranes, and in their structure and composition resemble greatly the cartilages. There are several kinds, and in the following examples, they are attached to two bones, and assist in the formation and strengthening of the joints. Ligaments are of various forms: some completely enclose the joint as in a case or capsule, and are called connexions; others form straight bands passing from one bone to another; whilst others, again, are inserted into the heads and cavities of bones within the joint. For the names of the various ligaments and their functions forming the ligaments see THORAC, ANIMAL, P. C. S.

LIGHT, ABSORPTION OF. [Absorption of Light, P. C. S. 714]

LIGHT-BALLS, for military purposes, are hollow cases, either spherical or in the form of cylinders, terminated at each extremity by a hemisphere: they are filled with a combustible composition, and being thrown, by night, in a burning state from mortars, or in some cases from the hand, they serve to discover the working-parties or troops of the enemy.

The spherical cases are made of canvas or cartridge-paper, cut into eight equal gorses of a proper form and the edges sewn together, a hole being cut in the introduction of the composition and the application of a fuse. The oblong cases consist, frequently, of two hollow hemispheres of iron, which are connected with each other by four slender bars of iron attached to the inner surfaces, in position to the body of the case, and the whole is then covered with canvas: the entire length is about 14 calibre of the piece of ordnance from which the ball is to be projected,—a mortar of one of the four different kinds, with cases varying from 4 inches to 10 inches a boiling state; and sometimes a small quantity of mealed gunpowder is added. The oblong balls are filled by passing the composition through a fuse-hole in one of the hemispheres, and are afterwards, when strengthened by cord with a load of gunpowder or oil, are filled with a combustible composition. A charge of fire is communicated to either kind of ball, at the time of being projected, by means of a piece of quick-match in the fuse.

Previously to besieging a fortified place, the works and the ground about them are reconnoitred, usually by; the first trenches are also traced and formed during the hours of darkness, and therefore the defenders, at the commencement of the siege, prepare some mortars charged with light-balls: these balls being thrown beyond the glacis, enable them to discover the operations of the enemy, and direct a fire of shot against them. The assualt of a breach is also frequently made by night; and in this case light-balls should be thrown by the defenders into the ditches of the place for like purposes.

These may be made by merely filling grenades with the composition, through the breech, and then firing it by the same means as a shot.

Major-General Sir J. T. Jones states (Journal of Siege), that the defenders of the towns which were besieged by the British army in Spain threw light-balls in order to discover the operations of the enemy, and to project a flame of oil and pitch. The engineers' brigade were kept in readiness to run up and extinguish them as they fell. That officer adds that the men generally succeeded, in a few seconds, in extinguishing them with filled sand-bags, or by throwing earth over them. Some casualties are stated to have occurred among the men so employed; but the fire of the enemy being directed against them, they were thereby diverted from the working-party often employed at a great distance from the breach. On account of the great utility of such balls for illuminating the ground occupied by the enemy, Sir J. T. Jones recommended that grenades or other missiles should be connected with them by pieces of cord. The name was suggested by the fact that the men might be deterred from attempting to extinguish the light.

It may be added that spherical cases of pasteboard or canvas filled with a composition which while burning emits a great quantity of light, and smoke, are frequently used in mortars in order to conceal a movement of troops from the view of the enemy: they are also occasionally thrown from the hand either to suffocate the men employed in the galleries and breaches, or to set the fire to the houses in all the cases are called smoke-balls. The composition consists of mealed powder (6b.), pulverized saltpetre (1lb.), pulverized seaweed (1½ lb.), pitch (2½ lb.), and tallow (4 lb.); the pitch and tallow are melted together, and the dry materials, after being sifted, are mixed with the liquid.
L I G

LIGHTHOUSE. [Sect. Laws, P. C. S.] A Light-house is a structure which gives the right of enjoy-
ment of free access of light to a man's premises or buildings, which right must not be impaired by the building or erection of any object in such a way as to obstruct the light. By the 2 & 3 Vict. c. 40, tit. V., sect. 19, the right to light given to a man, who has more than twenty years' uninterrupted enjoyment, unless the use has been enjoyed by some consent or agreement made or given by deed or writing.

When a right to light has been established, he who occupies or owns the adjoining land cannot build in such manner as to obstruct the light. If such obstruction is built or erected, the person who is injured has an action on the case: and the Court will not, if the building is erected in 1842, or afterwards, without the consent of the owner or occupier, declare a person to be in default, merely because the building obstructs the light. The object, therefore, is to prevent the building or erection causing such a privation of light as to be an illegal act.

The right to the free enjoyment of Light belongs in the Roman law to the class of Servitii (essemens), among which were the Servitii a lumen non condendi, those in common officiari, ne prospectus officiari (Dig. 8, tit. 2, s. 3, 11, 12, 15-17). The general rule is thus expressed by Ulpian: 'If the owner of the building by his light, or by doing anything else to damage them, must not be held for the obstruction of the light. But he will have it to the time of your neighbour's light is to be extinguished; and if you and your neighbour cannot agree about the height to which the light shall go, if you begin to erect, you will have the privilege of having an arbiter.'

It is said that according to the English law the stopping of a prospect is not a nuisance. The Roman law, as already observed, allowed a Servitius ne prospectus officiari. The Roman rules of law as to essemens in general are more precise than those of the English law.

LIGHTS, ARTIFICIAL. Within the last few years many new inventions have been introduced for the illumination of apartments—by candles, by lamps, and by a sort of combination of both. The modes of illuminating large buildings have been explained in Gas, P. C.; Bond Light, P. C. S.; Drummond Lights, P. C. S.; while the articles Alard, P. C., and Candles, P. C., illustrated the common modes of domestic lighting. The recent inventions may be classified at 1. Candles; 2. Candeleo-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 Blandell, for making candles of palm-oil, maragric acid, and stearic 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 kept in the sun until it becomes nearly saturated with quicklime, and the mixture is afterwards brought to a crystallized state by the action of cold water. Muriate of lime and sulphuric acid are then employed to separate the quicklime from the oil. The quicklime being washed and dried, is then cooled, and crystallized, are pressed, whereby the stearine is separated from the margarine. The two are separately heated, and the stearine goes through further refining processes, until it assumes the form of a pure and solid kind of palm-wax or hardened tallow, fit to make into candles in the usual way. The margarine, or margaric acid, obtained in this way, is mixed with common tallow 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, so as to come into contact with the atmosphere, and thereby render the troublesome process of 'snuffing' unnecessary; this consisted in impregnating one side of the wick with common starch 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 extinguishing the spiral, by the gradual burning of the candle, causes the tops of the wicks to spread out laterally beyond the boundary of the flame. The carbon or ash is not conveyed to the lower end of the wick, but accumu-

The circumstance of palm-oil being in a solid state in our climate, coupled with an ascertainment of mode of separating it into three different substances, has led to many suggested variations in the mode of making candles, by the mixture of one or more of these component substances with the oil, or the use of certain kinds of animal fat. There have also been patents taken out for new varieties of wick, and new forms given to the candle; but these do not involve any features which call for much notice.

2. Candle-Lamps. A Candeleo-Lamp 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.

The Soho lamp, patented in 1842, is used for burning solid tallow or some other kind of fat; although the lamp itself is very similar in shape to many of those used with oil. The tallow is brought to the form of a long cylinder like a candle without a wick, and is placed in the vertical stem of the lamp; there is a spring spring beneath it, which presses it up close to a conical cap or cover at the top. A fixed tube passes up through the centre of the cylinder of tallow, from top to bottom; and the lamp is kept in position by means of a wire, which, at the lower part, is fixed loosely within the lamp, and at the upper part, is fixed tightly to the conical cap or cover of the lamp. When the lamp is lighted, the wick is drawn down below the top of the tube, and again raised before the tallow becomes cold.

The lamps or contrivances now made for burning Palmer's candles, and which are indeed fitted for most kinds of candles, bear a good deal of resemblance to the above, in respect of having a conical cap to keep the candle within the tube, and a spiral spring in the lower part of the tube to press the candle upwards as it burns; but there is no necessity for the central wick tube, since the candles employed have wicks of their own. These candles, and the candles belonging to them, offer the two conveniences of maintaining the light always at an equal height, and of dispensing with the aid of the snuffer. Some sort of shade or globe is necessary for realizing the latter of these two benefits fully; since the flame becomes very un-

One of the projects of this class consists in placing any kind of wax or tallow or fat into a receptacle, and giving either hot water or hot metal beneath it, so as to keep it in a melted state, fitted to be used in the same manner as oil; but any method of keeping the water or the metal hot would seem likely to be a far greater inconvenience than any supposed good arising from the use of a solid form for the lamp. In the preliminary contrivance, however, where the substance employed is either tallow or fat, there is a piece of metal which descends from the flame into the vessel containing the latter; and this metal, being gradually cooled and crystallized, is pressed by the weight of the metal enclosed in the vessel, which is heated by the lamp, and thus kept in a melted state. The inconvenience of such arrangements arises from the circumstance that the hot water or a heated piece of metal must be put into the lamp before lighting it, and it must be taken out of the lamp before it is extinguished. A preliminary step is taken, the tallow is kept in a melted state by various means. One ingenious mode consists in having an air-tube within the wick, to carry air up to the flame, and two projections from this tube at the top, into the flame itself; so that the metal of which the tube is made, becomes heated at the upper end, speedily communicates heat to the contents of the lamp below.

There are many curious little pieces of mechanism, patented within the last few years, the object of which relates principally to the burning of common candles, or the mode of adjusting them to the candle-sticks. One consists of a candle-stick constructed in a circular ring, which rings are suspended from a conical cap which rests on the top of the candle; as the candle burns, this cap sinks with it, and the length of the candle is kept at the same height as the level of the flame, though not relatively to the level of the table on which the candlestick is placed. Another contrivance is intended to afford the means of adjusting any candle, large or small, to a large candlestick, by having a semicircular piece of brass, which is made to press against one side of the candle in the socket. A similer contrivance for the same object consists of a pair of wedges, placed one on either side of the lower end of the candle. A part of the same apparatus consists of a wire-frame for supporting a shade, and which is itself supported by having a sort of circular spring hoop, which clamps the candle.

3. Oil-Lamps.—One of the difficulties which have arisen in L 2 D 2
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 engaged attention within the last few years. Dr. Ure remarks (p. 184.), "The lamp manufacturer can no longer afford to use even stearic candles, as also the nuisance of the light from tallow ones, have led to the invention of an endless variety of lamps, of which the brighter kind is undoubtedly the mechanical or Carcel lamp, so generally used by the affluent families in Paris. In this lamp the oil is raised through tubes by clockwork, so as continually to overflow at the bottom of the burning wick, and hence to prevent the flame from puffing, while the excess of the oil drops back into the citeron below."

There is a lamp called the Meteor lamp, having some of the properties of the Carcel, but intended for burning 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 escaping 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, is made by the piston; of the damping, and of the gallery which supports the glass chimney, are all of an intricate kind, and, whatever may be their efficiency while in good order, would render the repair, in case of accident, a matter of much difficulty.

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 oil is used in a hot state. At a small distance above the wick, there is a tube, the lower end of which is connected with the bottom of the reservoir, while the space between the two tubes, of capacity sufficient to hold a pint, constitutes the reservoir for the oil. The oil is thus near the flame, that it speedily becomes warm, by which its facility of burning is much increased; and this, together with the pressure, causes the oil to descend from the reservoir to the wick. The intensity of the flame is modified by raising or lowering a slide on the lamp, by means of a rack and pinion mechanism. 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 merely to some modification of this arrangement. The Scotch Argand, according to Dr. Ure (p. 175.), allows air to pass up through the interior of the wick, as in the Argand; but the action of the air on the exterior of the wick is made more decided. The wick passes through a hole in the centre of a cask, which is fitted with a cap or close to this hole, and in a horizontal direction, while the flame is yet small; so that the exposure of the gaseous products to the air is much more intimate than in the ordinary lamps, and the combustion 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 dome to direct the external air more directly upon the flame. 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 food for lamps intended for domestic purposes, is a modern innovation, and has led to much mechanical ingenuity in the construction of the apparatus.

The term "spirit" is rather a vague one, since there are many kinds of spirit which are inflammable enough to be used for this purpose; but the kind here alluded to is the spirit of turpentine, or that liquid which is distilled from common turpentine by being separated from the resin which is a component ingredient in this well-known substance. When brought to its purest state, this spirit is called by the chemists camphine; and hence the name for some of the modern spirit-lamps. Turpentine being a very abundant produce of the American forests, camphine 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-makers to the practical utility of using camphine as a substitute for oil. Many different lamps have resulted from these inquiries; and different processes have also been adopted for freeing the turpentine from a small quantity of oil in which it commonly appears.

Young's "Vesta" lamp is one of these varieties. In the specification of the patent it was stated that the lamp is constructed for burning rectified spirits of turpentine, or camphine; that, on the removal of the stop-cock, sufficient of this 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 liability of the liquid to evaporate, and the probability 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 "Gren," or "Parker," or "Paragon," or "Spermaceti," 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 pillar and the burner; the spirit is contained in the reservoir, and is supplied to the burner by means of an air-tube. 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 if "burning be an unalloyed pleasure," it emits a light equal to very nearly twelve wax or sperm candles of three or four to the pound; and in so doing it consumes exactly one-twelfth of the value of wax (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 of oil-lamp, in relation to the quantity of light yielded. All lamps-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. A lamp, therefore, while it emits no foot combustion, and also so as to avoid danger, are questions for the manufacturer; but in a scientific point of view, camphine seems better fitted for combustion than oil. It is not necessary that the flame should be done from the same source, but it is necessary that it should not drip; and the oil lamp is effective on this account. The chief danger is that subjected to careful distillation and rectification, will yield a spirit or camphine differing but little from that yielded by turpentine.

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 product of combustion.

Pecquet, Dr. Ure, and Dr. Frye have all instituted experiments bearing on the former of these two questions. Pecquet experimented on candles only. He determined what would be the value of different kinds of camphine, in producing a given intensity of light, as determined by Carrel'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; spermatici; wax. This relation was as to price only; the relative weights of material consumed followed a different order of arrangement, the spermatics being the least, and the pressed tallow the greatest. 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 candles, are placed in the following order:—To have the same effect as:

- Black-oil, or Hot-oil lamp, with spermaceti; or, with common olive-oil; or, with coconut-oil;
French lamp, with sperum-oil.
Mould tallow candles.
Palma-oil, and sperum candles.
Stearic acid candles.
Cocoa-nut stearine.
Spermaceti candles.
Wax.
the first being, in point of economy, the cheapest, and the last the dearest.

Dr. Fyle's experiments ('Transactions of the Royal Scot.

tish 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 the proportion that the light was produced, to rank as follows:—tallow with single wick, cocoa, composite, palm, tallow with double wick, wax, diaphane, margarine, spermaceti, and composition. In another table, comparing gas with candles, he ranks palm wick third, and the following intensity of light being uniform:

**Argand gas-flame** 1:00
**Solar lamp** 2:00
**Naphtha** 3:00
**Solar oil in Argand lamp** 3:98
**Whale-oil** 5:00
**Sperum-oil** 8:00
**Tallow candle (two wicks)** 12:70
**Cocoa candle** 13:10
**Tallow candle (one wick)** 13:50
**Composite** 14:50
**Balm** 18:90
**Wax** 25:90
**Diaphane** 27:10
**Margarine** 29:20
**Spermaceti** 29:20
**Composition** 29:20

According to this table, composition candles are nearly thirty times as cheap as gas 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 Alexandra Club, that the dearth of stamens was vitiated and the hindering of the books injured by the lamp 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 remedying the evil. In a paper communicated to this body (Session 1843) he adduced striking proof of the magnitude of the product resulting from combustion. Oil and gas each contains carbon and hydrogen, and each has an attraction for 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 two—water, by a combination of some of the oxygen with the hydrogen of the oil or gas; 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 combination, 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 oxygen from 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 oxygen gas also produces nearly three pounds of carbolic acid, and a pound of gas two and a half pounds of carbolic acid. For every cubic foot of gas burned, rather more than a cubic foot of carbolic acid is produced.

As the water produced deadens the effect of the flame, and as the carbolic acid is very deleterious to the lungs, Dr. Faraday contrived a mode of carrying both off without allowing them to mix with the air of the room. A tube is admitted to feed the flame, nearly in the usual way; but when the products of combustion have arrived at the top of the glass chimney, their progress is arrested by a covering of tare, and they are completely passed 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 carbamic acid, aqueous vapour, smoke, and other emanations from the flame have no means of escape except through this tube, and they are thus wholly cut off from contact with the air of the room. The mode of carrying off 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 in the room less vitiated than when common open burners are used.

**LIGUZZI, JA/COPO,** a distinguished Italian painter in fresco and in oil, was born at Verona, in 1643, and 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 Paolo Veronese, Liguozzi was an effective and powerful colourist, and at the same time that he displayed vigour in the colouring of the Florentines, he improved his own drawing. The Grand Duke Ferdinand II. appointed Liguozzi his principal painter, and superintendent of the Imperial Gallery. He died in 1697.

Liguozzi is the painter of several grand works in oils, 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 a large scale. 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,—Sts. quattro Coronati—at Ghi Scalzi; or the barred friars, at San Lorenzo, and the Martyrians of Santa Dorothy, at the Conventual Friars, at Pescia. Liguozzi executed also many small highly finished easel pictures. Agostino Carracci engraved some of his works. (Lanzi, Storia del Arte, etc.)

**LIGUSTRUM,** a genus of plants belonging to the natural order Jasminaceae. It has a flaxly fruit, the berry containing two mesomalous one-seeded nuts. The calyx is short, tubular, and four-toothed; the limb of the corolla 4-petalled and spreading; stamens 2, with short filaments. The species are shrubs or low trees, natives of Europe and Asia.

**L. vulgaris,** Common Privet, has elliptic lanceolate phloem leaves; compound racemes; white flowers; white at first, but soon changing to a reddish brown. The berries are dark purple, almost black. It is a husky sub-evergreen shrub, growing in hedges and thickets in Great Britain, and native of the South-west of England. This plant was formerly called Prin, or Prinvum, from its being used for verdant sculptures, or topiary-work, and for primly cut hedges. The common English name Privet seems to have been derived from this, from its being frequently planted to conceal private places. In German, Dutch, Danish, and Swedish it is called Ligustrum; in French, Troupe; in Italian, Ligustro; in Spanish, Afena; and in Portuguese, Afnha. It is probably the Epstein 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 damaged by frost or disease, and robins the grass 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 the dripping of other trees. The wood is hard and fit for timbers; the oil of the leaves is a very subtile and coloured pigment may be prepared; with the addition of alun they dye wool and silk of a good durable green. The following varieties are those found chiefly in our gardens:

- **L. v. luscorum,** the weaver-rod privet, or Sinhance.
- **L. v. chinocarpum,** the yellow-berried privet.
- **L. v. chlorocarpum,** the green-berried privet.
- **L. v. sempervirens,** the Italian or evergreen privet.
- **L. v. sargiogenum,** the variegated-leaved privet.
- **L. v. austriofolium,** the narrow-leaved privet.
- **L. Sinensas** has lanceolate 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. spectum** has elliptic acute leaves, hairy beneath, as well as the branchlets. Flowers crowded, almost sessile, spicate, disposed in a thyrse, having the axis very hairy, and covered with minute bristles.

- **L. spectum** has broad leaves, growing on mountains, from six to eight feet in height. All the species of Privet are of easy culture, and will grow in any kind of soil. Cuttings root without difficulty. **L. buchhoms** requires some protection in the winter. (Don, Gardner's Dictionary; Babington, Manual of British Botany; Eras, Syrosous Flora Classiosa; Loudon, Encyclopaedia of Trees and Shrubs.)
LILAC. (Strinsa, P. C.)

LILITUM (the Latin Liliatum, and Greek λιίλιον,) a genus of plants the type of the natural order Liliaceae. It has a perianth of six leaves spreading or reflexed, with a longitudinal nectariferous furrow at the base of each; an undivided ovary, free or united, and perianth-like stigmas, and flat seeds. The colour of the flowers is either white, yellow, or red.

L. candidum, common White Lily, has lanceolate scattered leaves, a bulb with a shallow smooth corolla, the petals 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 stalk, solitary or in pairs, and 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. Sibthorp, found it growing wild in that classical and celebrated spot the Vale of Tempe. It is the epigeus of Theocritus (Id. 23) and of Dioscorides (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 they contain immediately makes the flowers unattractive. The flowers are only found available in medicine, and they are frequently employed as emollient poultices, owing to the mucilaginous nature and peculiar odour which they contain. They are, however, doubtless valuable medicinal plants, whether more efficacious than poultices formed of bread or farina. Gerard prescribes the lily root internally in droplets, and for this purpose bread was made of barley meal with a little water, and eaten two or three times, 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 lily is exceedingly powerful, and peculiarly disagreeable to most people. It is stated that there is an instance of death ensuing from exposure to the odour of this plant.

L. bulbiferum, Bulb-bearing or Orange Lily, has linear-lanceolate scattered leaves, a bell-shaped erect corolla, glabrous and smooth, its segments are large and handsome, of a beautiful red or orange colour, pale on the outside, and without any scent. The bulb is composed of numerous thick white loosely imbricated scales. This species and L. chalcedonica is probably the epigeus of Theophrastus, 'Hist. Plant.' 6, 6, and undoubtedly the spatha-caledis of Dioscorides, 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 leaves form a branched reflexed pyramid, and are large and handsome, and of each branch, rather divided near the tips; 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 1738.

L. martagon, Martagon Lily, has white or purplish lanceolate leaves, pubescent scarious nodding flowers, and a reflexed perianth. Though not a native of Great Britain, it is naturalised in copes 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 better left on for two or three years. The proper time for separating them is in summer and autumn, when the winter is past and the stalks decayed. By doing this they form them firm in the ground or removing the whole and dividing the offsets from the main bulb when uncovered; they should then be planted in full sun, and three lights deep, to remain one or two years; the large roots set again in the borders singly.

The sowing of seed is chiefly practised to obtain new varieties of Martagon; it should be done in the autumn, soon after the seed is ripe, in pots or boxes of rich light sandy earth, with holes in the bottoms balf inch deep; the pots or boxes should be placed in a sheltered position during the winter and refreshed often at first with water; the plants will in two years be ready for setting out; in August they should be transplanted into nursery beds in flat drills an inch deep and three or four sunders. 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 bunches. All the species and varieties of Liliot are valuable as plants of ornament for the beauty of their flowers, which have a noble appearance. 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, orange lily, and maroon lily are the finest. The orange-lily also answers well for small gardens and confined situations in towns and cities.

(Babington, Manual of Brit. Botany; Fries, Synopsis Plantarum Plur. Flora Classicæ; Rees, Encyclopaedia.)

LIMBURG, a town in the province of Liege, in the kingdom of Belgium, situated in 50° 40' N. lat. and 6° 8' E. long., on the West (Weser). It is a fortified town with two gates, on a mountain, at the foot of which is the suburb of Delhem 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 neighbourhood. The railroad from Brussels to Aix-la-Chapelle passes near Limburg.

(Tissel, Handbuch: Stein, Lexicon.)

LIMBURG ON THE LAHN, situated in 50° 20' N. lat. and 6° 8' E. long., is a town in the duchy of Nassau. It is the see 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 particular notice. It is near the site of the Roman vicus of earthenware, and carry on a considerable trade in the productions of the country.

(Cannacheich, Geographie; Stein, Handbuch, by Hörnemann.)

LINA/RIA (from linus, flax, owing to a similarity in the leaves), a genus of plants belonging to the natural order Scrophulariaceae. It has a 5-parted calyx, a pessamaeum spurred corolla, the lower lip 8-6 with a prominent plate closing the mouth. The capsules open by valves or teeth at the top. The species are annual or perennial plants, very rarely small shrubs, and the flowers of a beautiful appearance, racemose or spicately disposed, as the type of the genus. It is a native of Europe and Africa, and is found in chalky corn-fields in Great Britain.

L. gynandra, 4-veined toad-flax, has roundish heart-shaped leaves, 5-lobbled 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, halbert-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, the lower lip 8-6 with the upper lip purple. It is a native of Europe and Africa, and is found in chalky corn-fields in Great Britain.

L. sparsia, spurious toad-flax, has roundish ovate entire leaves, the lower one divided, the peduncles hairy, 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. minor, smaller toad-flax, is distinguished by its linear lanceolate leaves, which are obtuse, glabrous, pubescent, and mostly entire. The flowers are solitary and axillary, the peduncles three times as long as the calyx, and the seeds elongate. It is found in sandy corn-fields throughout Europe and Great Britain.

L. pelosinum, is known by its racemose flowers, which are of a dark violet colour with darker venus. It is native of the south and middle of France and of Great Britain.

L. repens, is distinguished by its lanceolate sepals and angular seeds with transverse elevated lines. The stem is 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.

L. Italica has scattered linear lanceolate leaves, lanceolate oblong sepals, and orbicular scarious seeds, with a membranous margin. The corollas are of a deep yellow colour. This species is native in the east of England and near Cork, in Ireland; it is also native of Switzerland, Italy, and Hungary.

L. vulgaris has ovate acute glabrous sepals, shorter than the capsules, and the spur. The flowers greatly resemble
those of *L. Italicus*, but are twice the size. In Worcestershire this plant is called *Butter and Eggs*. Gerard names it wild-flax, scold-flax, and that-flax. It abounds in an acrid oil which is almost empyreumatic. Taken inwardly, it induces nausea, and its power—Bishop Cotton durst neither drink nor otherwise disapprove of it. When united with milk the juice is a poison to flies.

The whole of the species of *Linaria* have an elegant appearance, and are therefore suited for garden vases. They grow well in common garden earth, but prefer a dry sandy soil. The seeds of the annual species require to be sown early in the open border where they are intended to remain. The perennial kinds may be propagated by division at the roots or by seeds.


LINDSAY, SIR DAVID, a Scottish poet, was born at Garmynot, 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 sur- vior, or gentleman usher, 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 to seem to have himself exercised the craft of nursing. He says—

> When thou was young, I bade thee in my arm And held thee in my hands that hope might spring; And in thy bed didst thou fast all night; With late in hand eye softly to thee sang; And often morning to thee I sang, In tenderly I flang; And sometimes playing on the floor, And sometimes on my back I sang."

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 entrusted with the education of the prince, which was placed in the hands of a more suitable person—Bishop Gavin Dunbar. Neither can his Lindsay's name be connected with a curious and poetical incident. He is the author on which his kinsman, Lindsay of Pitscottie, in his *Chronicles of Scotland*, describes a spectral apparition which, in 1518, 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 *a man clad in a blue gown, belted about him with a roll of linen cloth, a pair of bootkins on his feet to the great of his legs, with all other clothes covered therewith,*

The *Dreme*, supposed to be the earliest 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. The principal persons are *Comyn* and the *Papigow*; *Complaint of John the Commonweal*; *History of Squyer Meldrum*; *The Monarch*; and *The Play, or Satire, on the Three Estates*. There is little sentiment or pathos in Lindsay's style. He* particularly avoids a tone of sarcasm, which is 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 assails the attacks on the priesthood and the corruptions of the court; and after the Reformation his name was long popular as that of a Protestant champion. *The Satire on the Three Estates* was expressly written during the Maida drunkard of 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 eccle- siastical, which had become so prevalent. It *was an unanswerable 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 *ex* had been so truthfully and touching described.* Another feature that makes the circumstance of Lindsay's performances having such an audience, seem strange at the present day, is their broad indecency. It is certainly believed that the performances of the 17th century were of a more moral nature. Baring-Gould says, as he was long called in Scotland, seems to have had an innate liking for what was impure. His *Squyer Meldrum* is a sort of chivalric history of adventures, some of which exhibit a very loose and dangerous morality. Lindsay held the office of Lord Lyon King at Arms. In 1537 he had 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 he 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 respectable merchant and pro- prietor of salt-works at Midshires, near Middlewich, where he was born June 20, 1723, Old Style. His mother having some connection with the family, by whom she was much respected, Theophilus, Earl of Huntington, husband of Selina, Countess of Huntingdon, adopted 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 which time, in his twenty-third year, he commenced his clerical duties at an episcopal chapel in Spital Square, London. He then became domestic chaplain to Algernon, 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 1756, he was presented to the living of Kirby Wiske, in the North Riding of Yorkshire; and in 1758 he removed to that of Piddington, in Northampton. In 1769 he married a step-daughter of his intimate friend Archbishop Blackburne, and in 1763, chiefly for the sake of enjoying his society, and that of other friends in Yorkshire, he exchanged the living of Piddington for one at Catterick, which was nearer to his residence.

Before this removal Lindsey, who had felt some scruples respecting subscription to the thirty-nine articles even while at Cambridge, began to entertain serious doubts concerning the Trinitarian dogmatical views of the Church of England. Though, 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 asent to them on en- tering a new living. In 1790 his anti-Trinitarian opinions 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 had been entered upon himself. While contemplating the duty of resigning his living, Lindsey was induced to defer that step by an attempt which was made in 1771, by several clergymen and gentlemen of the learned professions, to obtain relief from parliament in the matter of subscription to the thirty-nine articles, and in which he joined heartily, travelling upwards of two thousand miles in the winter of that year to obtain signatures to the petition which was prepared. The petition was presented to the House of Commons on the 5th of February, 1772, with nearly two hundred and fifty signatures, among which were those of many eminently pious and learned men; but, after a spirited debate, its reception was negatived by 271 votes to 23. Being induced to apply for a representation to parliament in the next session, Lindsey still deferred his resignation; but when the intention was abandoned he began to prepare for that important step, which involved not only severe personal sacrifice, but a separation from many esteemed friends. Strengthening his mind for the trial by the example of the two thousand ejected ministers known as the Bartholomew divines, he drew up, in July, 1773, a copious and learned *Apology* for the step he was about to take, which was subsequently published. In the following December, notwithstanding the attempts of his diocess and others to dissuade him from the step, he formally resigned his connection with the Established Church, and, selling the greatest part of his library to meet his pecuniary exigencies, he proceeded to London. He and his wife reached Exeter early in the 1st January, 1774, and they were soon reduced to so strait a state as to be compelled to sell his books, *which* were purchased at an auction by *M. Bayezid* in Essex Street, Strand, which, by the help of friends, he had been enabled to convert into a temporary chapel. His desire being to devote as little as possible from the mode of worship which he adopted in the old church, he was slightly altered from that modification of the national church- services which had been previously published by Dr. Samuel Clarke; which modified liturgy, as well as his opening sermon, *Lords, Strand, in 1774, Lindsey published a Letter to the ..."
for the maintenance of Unitarian worship. His published 'Apology' having been attacked in print by Mr. Burgh, an Irish M.P., by Mr. Bingham, and by Mr. Randolph, Lindsey published an Answer in 1776, in which he answered 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 Union of the State of the United Doctrine and Worship 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.

He commenced his biographical examination of Mr. Robinson of Cambridge's 'Plea for the Divinity of our Lord Jesus Christ, by a late member of the University.' The work to which this reply had appeared several years before, but Lindsey, who disliked personal controversy, had not intended to anwer it, though his friends at length prevailed on him to do so. In 1788 he published 'Vindiciae Fidei Italiana,' a defence of his friend Dr. Priestley, in the form of an 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 1792 he invited Dr. Dimey, who then left the Established Church on the same grounds as he had done himself, to become his colleague in the ministry at Exon Street, and in 1793, on account of age and growing infirmities, he resigned the pastorate. He died in his hands, publishing on that occasion a paper well discoursed (which he felt himself unable to preach), and a revised edition, being the fourth, of his liturgy. He nevertheless continued to reside at the chapel-house, as did his works. In 1795, he republished, with an original preface, the 'Letters to a Philosophical Unbeliever,' which Dr. Priestley had recently published in America in reply to Painle's 'Age of Reason;' and in 1800 he republished in like manner Priestley's works, with the knowledge of which he had not been acquainted.

The work was published in 1803, entitled 'Conversations on the Divine Government; showing that everything is from God, and for good.' The work was published on the first day of 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, 1803, 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 embraces, besides those above mentioned, several single sermons which were printed in very large numbers, and two volumes of his sermons were published shortly after his death. Another biographical 'Memoirs' of Mrs. Cappe, published in 1822, also contain many notices of Lindsey. A portrait of him accompanies Belsham's "Memoirs."
his former master Masolino into the picture of the 'Conce- 
conration,' which may have been done from memory or from some 
extisting portrait, for Masolino was certainly dead before 
Fra Filippo could see it. 
Fra Filippo is said to have been poisoned by the relations of 
Lucrezia Butti; Lanzi speaks of the fact as certain, but 
Vasari merely alludes to it as a vague report, which is the 
most the time of his life. 
It probably did her little service by poisoning Filippo, whom she evidently 
loved, for she would not return to her relations; and fifty-
sev'een years is no s very sho: life for a man notoriously given 
to pleasure; his death took place eleven years after the abduction of Lucrezia, for Filippo was ten 
years old when his father died. 
Fra Filippo was buried at Spoleto, in the cathedral, which he was engaged in painting 
at the time of his death. The son was instructed in painting by 
Filippo's pupil and assistant Fra Diamante. He after-
wards erected a marble monument, with a Latin inscription 
by Politian, to his father in the cathedral of Spoleto, by the 
order and at the expense of Lorenzo de' Medici. 
Fra Filippo excelled in invention, in drawing, in colouring, 
and in chiaroscuro, and for his time was certainly a painter 
of extraordinary merit; he must, even without reference to 
time, be accounted among the greatest of the Italian 
painters from Masaccio to Raphael, both inclusive. Some 
of his easel pictures in oil are finished with extreme care 
and great certainty, there are few in the history of the Florentine 
Academy, of which the Coronation of the Virgin, formerly in 
the church of Sant' Ambrogio, is an admirable work. There 
are some chalk studies of hands by Filippo in the British 
Museum. 
Several of his works have been engraved by 
Lasinio. 
Filippino, though not equal to his father in the higher 
quallities, surpassed him in others, especially in general 
accessories, which he was perhaps the first to bestow great atten-
tion upon, and he had much more taste than most of his con-
temporaries; he understood better the rendering of mere 
appearance, one of the most essential, though not one of the 
highest qualities in pictorial art. 
He excelled in painting Madonnas; but his chief works are the frescoes of the 
Frari Chapel, in Santa Maria Novella, and of the Brancacci Chapel 
of the Carmine, where, besides others, he painted Peter and 
Paul before the Procommus, which was long attributed to 
Masaccio, as in the 'Etruria Pittore,' where it is engraved, 
and in many other works. 
Vasari, Vita de' Pittori, &c.; and the notes to the German 
Translation by Schor; Baldini, Delle Pitture di Fra 
Filippo Lippi nel Coro della Cattedrale di Prato, &c.; Bal-
dinece, Notizie dei Professori del Disegno, &c.; Rumohr, 
Italianische Forschungen, Sperth, Kunst in Italian; Gaye, 
Carteggio Vincenzo Camillo d'Arriani, and Kastanbichl, 
Liquiddity is that condition of a material substance 
in which the particles have a perfect freedom of motion, 
without any sensible tendency to approach or to recede from one 
another, except by the action of some external power. 
Liquidity is therefore comprehended in the condition 
of fluidity, the latter term being applied as well to gases, 
and even to the principle of electricity, magnetism, &c., as to 
water, oil, &c., which are properly called liquids. (Fliiuin, 
Fluiditt, P. C.) 
The phenomena of capillary or molecular action show that 
the attractions which constitute what are called the affinities 
of substances extend to very small distances only from the par-
ticles; and hence, when the particles of a substance are situated 
beyond the limits of such attractive forces, the repellive power, 
arising probably from the action of caloric, causes the particles 
to repel each other, and to be scattered into a state of 
aciform fluidity. Now the phenomena of crystallization seem 
to indicate that the attraction of affinity is exerted with greater 
or less intensity according as the like or unlike sides of the par-
ticle are nearer together, or more remote from each other, in 
their mutual approaches; but it is probable that this modific-
tion of the attraction of affinity extends to lesser distances 
from the centres of gravity of the particles than the general attrac-
tions between them; and it may be inferred that whenever the one 
another in their mutual approaches; but it is probable that this modific-
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tion of the attraction of affinity extends to lesser distances 
from the centres of gravity of the particles than the general attrac-
tions between them; and it may be inferred that whenever the one
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 this plate, the last in and the paper of a
passing between two rollers, the apparatus of which has an
elasticity or softness given to it by layers of padding or felt;
and the degree of closeness between the rollers is regulated
according to the strength or thickness of the impression re-
quired.
In the lithographic process, the pressure is accomplished by a
sort of scraping movement. Soon after the adoption of this
brass plate, the general practice was to use a wooden
broad table for holding the stone, covered with a tympanum
or stretched parchment; the engraved stone was inked by
rollers, the paper was laid down on it, the tympanum was
brokendown or rolled up, and the stone was pressed
firmly on the tympanum; 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'se lithographic press has a cast-iron upright 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 by leverage, is governed by a spring, which keeps it
close to the tympanum. The tympanum, or 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 pressing-bar. 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
duly named by Owen.
LITHOSPERNUM (from Latin, a stone, and sperma; seed;
into Latin, to the hard seeds or nuts), a genus of plants be-
ing to the natural order Boraginaceae. It has a deeply cut
calyx in five segments, a funnel-shaped corolla, with a nated
or minutely five-keeled throat. These segments 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. officinalis, Grasswell, has an erect much-branched stem,
 lanceolate acute valved leaves with tuberces and adpressed
briatles above, hairy beneath; the throat of the corolla has
minute scales within, and is of a pale yellow or greenish
colour, with whitish, minute, very hard, minute or three ripening in each calyx. They were esteemed in antient times as an infallible litholithic; their virtues in this
respect are, however, entirely imaginary. This species is native of the Tyrol, the Alps, and North America. It is found
in dry and stony places in Great Britain, but sparingly.
L. purpureo-cerulites has herbaceous stems, the barren
ones prostrate and creeping; the others erect. The leaves are
lanceolat, acute, scarious, of a dark green, with revolute
margins. The flowers are showy and large, at first red, and
afterwards of a bright blue. The nats are white, highly po-
lished, and hispid. This species has no scale 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 acute, hairy, and subscissil; the calyx a
little shorter than the corolla; the nuts tubercular, wrinkled,
polished, and of a pale brown. The throat of the corolla is
developed into scales, as in the former species. The flowers are
white, very small; the root of a bright red, communicating its
colour to paper. It is native of Europe, Asia, Africa, and
some parts of North America, and is found plentifully in the
corn fields of Great Britain.
L. Turbinat is herbaceous procumbent stems, lanceolate
oblong leaves, hairy calyx a little shorter than the tube of
the corolla. The upper leaves are half-clasping the lower ones
on petioles. The flowers sessile in simple or conjunctive leafy
spikes, purplish, sometimes blue, generatling into a white head.
It is native of Spain, South of France, Italy, and Hungary,
in sandy sterile places.
L. tetramorium has an herbaceous erect branched stem,
lanceolate obtuse hairy scarios leaves, the lower ones oppo-
site; the calyx is shorter than the tube of the corolla, con-
fining when bearing fruit. It is native of Egypt and the
island of Cyprus, and has the habit of L. arvensis, but is much
deriger.
L. LIVERWORTS, or LICHENS, a family of plants be-
ing to the class Cryptogamia, of which a definition is given under that title prefixed to P. C. F. The order consists of between fifty and sixty genera, of which the tympanums are divided into four
sub-orders—Hymenothriptic, Gasterothriptic, Isidiophric, and
Coniolothic: to these some systematists add Bysseaceae.
L. saxicola, (D. S.) These are again subdivided into
several tribes, each tribe comprising several genera.
The tribe Usneaeeae are characterised by having an open
disk, and being destitute of a hypothallus. It embraces the
genera Usnea, Everina, Roccella, Remonia, and Cetraria.
Several species of Usnea are known by the common names of
Jupiter's beard, Tree-beard, &c., on account of their hair-
like appearance. They are amongst the most common of the
Lichens which cover the trunks of aged trees, and give to
them a picturesque appearance. Usnea plicata is a common
species on old trees, park palings, &c, and has been recom-
manded as a remedy in hooping-cough.

The species of the genus Everina are common in Great
Britain. One of them, E. procunaria, has a peculiar power of
imbibing in perfumed cadavers and sweet
pots. It has been recommended as a remedy in pulmonary
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 good for the head; &c.' It is similarly used by some
physicists under that name, as they do the fungi for the true
garlic (excellent for humours and fluxes), to the great
scandal of physic. It is said that E. pulmonacea is poisonous
and has a bitter taste, hence its name, but little is known of its real
properties.

The genus Remonia is found associated with the last
on the trunks and branches of trees, especially of the fir,
and the birch, as well as of the larch, pine, and the hardwod.
L. parietaria, Tree-beard, &c., promises in that intention to rival the famous Lichen
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 CETRAVIA, P. C. S.

The tribe Parmeliaeae is characterised by a horizontal
thallus. To it belong the genera Polypiera, Sicta, Borreria,
Remolca, &c.

Two of the species of Polypiera, P. canina and P. ephelocora,
have been used in medicine; the former as a remedy in
hydrophobia; the latter is boiled in milk and administered in
the third degree.

The species of Parmelia are exceedingly numerous; one
of the most common throughout Europe is the P. parietaria,
yellow moss. The thallus and shields are both of a yellow
colour; and Lightfoot says, 'It is affirmed to do a good yellow
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
fevers, and for dropsy and the gout.

The genus Cetraria is a species of the genus Cetrella,
affords the substance known as Litmus, or Laeum. [LITMUS,
P. C. F.]

One of the species of the genus Sicta, S. pulmonacea,
has been used as a substitute for the Iceland moss. [CERTRANIA,
P. C. S.) It is used in Siberia for giving a bitter flavour to beer. It is a native of Great Britain, and is found on the trunks of large trees in England, as well as in some other parts, and almost entirely covering them with its large shaggy fronds.

A species of Borera (Borera, P. C. S.), B. furfuracea, is reputed to be astrigent and febrifuge. It is found on the trunks of large trees in England, and is used for the treatment of many complaints.

The tribe Lodiculae includes the important genus Cladonia (Cladonia, P. C. S.), and also Coscinopora and Scyphophora, which are often found on the ground forming various species of Lichens to the distinguishing not only between the bark of different species of Cladonia, etc., but also between good and bad barks of the same species.

The tribe Sphaerophorae contains the genera Sphaerophora, Fuscaria, and Indiwm. They are exceedingly elegant group of Lichens, but the species have not been much used for ornamental purposes. Indiwm cardulium is said to be rich in colouring matter.

The genus Endocarpum and Porium belong to the tribe Endocarpae. 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 barks used in medicine. For, in his 'Méthodes Léthographiques,' one of the first gentlemen at the court of France, he has given a description of Lichens to the distinguishing not only between the bark of different species of Cladonia, etc., but also between good and bad barks of the same species.

The tribe Vertericis is Vertericia, of which the species are very numerous. [Vertericia, P. C.]

The tribe Graphopoeis is remarkable for the forms which occur in the skeleton of the letters of Eastern alphabets. This will be seen in Oephegara scripta, in Fig. 7 of the woodcuts illustrating the article Lichnus, P. C. As an indication of the value of the Lichens in distinguishing the various species of Cladonia bark, For states that the Graphia interrupta is only found on the bark of Cladonia lycophylla. Although the study of the Lichens on the official barks has not produced all the advantages anticipated by the botanical parties, there can be no doubt of its value in many cases. Referring to this subject, Burnett observes, 'Until the publication of For's memoir on the Cryptogamic epiphytes of the official barks, the study of the Oephegara and its allies seemed to be one rather of speculative amusement than of practical utility. But now the case is wholly changed, since in these graphic plants, these living letters, written by Nature's hand, are shown to constitute inscriptions legible by men. A diligent and curious eye, in projecting from the natural surface of the tree, the letters of an ancient or modern inscription, would be able, without any great expenditure of labour, to detect the characters of the ancient inscriptions, and so forth.

But, like the hieroglyphics of the Egyptian engravings, their meaning was buried in obscurity, and so little guessed at, that it often was doubted whether they had any meaning at all, or were nothing but the mere productions of the senseless forest. But, when the sight of a person familiar with the ancient language may detect the inscriptions of the vegetable world, and be of a natural Rosetta-stone deciphered these hitherto unknown manuscripts, and taught us to perceive this part of the sacred Scriptures of creation.'

But, like the hieroglyphics of the Egyptian engravings, their meaning was buried in obscurity, and so little guessed at, that it often was doubted whether they had any meaning at all, or were nothing but the mere productions of the senseless forest. The study of these inscriptions, it may be said, is a subject of inquiry, which may be compared to the discovery of the Chinese language, and the deciphering of the ancient Chinese inscriptions, by a person familiar with the ancient language may detect the inscriptions of the vegetable world, and be of a natural Rosetta-stone deciphered these hitherto unknown manuscripts, and taught us to perceive this part of the sacred Scriptures of creation. (Burnett, Outlines of Botany; Lindley, Natural System; Lindley, Floris Medicola; Elies, Lichinographia Europea reformata.)

LIVELYMEN OF LONDON. [London, P. C.]

LOCK, a kind of secret fastening in which a movable 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 as to lay a hindrance to the natural motion, 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 distinct definition 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 door to which it is applied by the action of the spring, without being moved from the other side without the application of the key. Many such locks fall under the general denomination of latches or latch-locks. In other locks, again, there are two or more bolts, one of which only can be removed under the control of the other being moved by handles; while in another class of locks two or more bolts are shot or project by the action of the key alone. In addition to such differences, the varieties in the form and size of locks, and in the arrangement of the parts, are almost infinite. In the kinds of lock in which the bolt is not under any circumstances projected beyond the casing of the lock, but is caused to shoot into or through a staple which drops into the lock to receive it. In deck-locks and some others the bolts project permanently, and are of iron, or of brass, of a hooked shape, adapted to catch, by a slight movement, into cavities or staples provided to receive them. Padlocks are a kind of detached lock in which a curved bar of iron, pivoted upon the lock at one end, may be passed through a staple, and then so secured by shooting the bolt into a cavity in its free end, which is inserted into the lock for the purpose, that it cannot be removed from the staples or links through which it has been passed.

By far the greatest part of the almost innumerable ingenious contrivances for rendering locks inviolable may be classed under one of two systems of security, the distinction between which was pointed out by Mr. Ainger in a paper read before the Royal Institution in 1827 (an abstract of which was published in the first volume of the Quarterly Journal of Literature, Science, and Art), and is further illustrated by the following statement: "The keys of a lock are closely connected by the literature of the Encyclopaedia Britannica. Of these means of security, the first consists in the insertion in the lock of fixed obstacles, commonly called wards, which prevent the entrance or revulsion of any instrument or key which may be used in opening the lock with corresponding openings, so as to thread its way among them, and thus render the bolt inaccessible to any but the proper instrument; while the second consists in the use of moveable impediments, which in their most general form are called tumblers (a term which, for convenience, we may apply generally), to the motion of the bolt itself, the security arising from the difficulty of bringing these moveable impediments, by the use of any but the proper key, to the actual and relative positions necessary to allow free motion to the bolt. In many locks both of the above means of security are used, but for convenience we shall here notice the peculiarities of each system independently of the other. In dealing with the first system we may include under one general head all contrivances whatever by which the approach of the key to that part of the bolt by which it is capable of being shot backwards and forwards is impeded.

The key of an ordinary lock consists of a cylindrical shank with a loop-shaped handle at one end, and a piece called the head at the other end. The key is inserted into the lock by projecting from the shank, and is turned round between the thumb and fingers, so that the bit end of the key may be seen in contact with a part of the bolt which is so shaped that the bit of the key cannot pass it, to complete its revolution, without a spring or other means, until it is again moved by the reverse action of the key.

The first and simplest means by which the entrance of a false key may be rendered difficult, is by giving a peculiar form to the substance of the bit, and either adapting the form of the key-hole exactly to it, or inserting pieces of metal in the lock in such a way as to prevent the admission of a bit of different shape. Fig. 1 represents several varieties of key-hole. (See Fig. 1.)
of the two could be employed to open the other's lock, the first having two pins or simple wards, the second two L-wards, and a third a T-ward between two plain wards; but while these afford security against ordinary keys, they afford no whatever against a pack or skeleton key like L, Fig. 3, which opens both other locks. This skeleton key is guarded merely by wards attached to the back-plate; the only part essential to the moving of the bolt being the extremity of the bit, which is retained in the skeleton key with nothing but a slender piece to connect it with the pin or tumbler. The security may be greatly increased by the use of other wards, attached to the 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 L. Such is the case in all the keys represented in Figs. 4, 5, and 6. In Fig. 4, L represents a key for a solid-warded lock, which might, however, be easily picked by a skeleton key resembling r, Fig. 6. The greater complication of the wards in m, Fig. 4, increases the difficulty of picking; while by the adoption of the arrangement shown at n, 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 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 axis, 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 bit, or, as it is sometimes called, the seat, 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 a very common form of 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 the key in the form 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 applied, with this difference, that when 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 remaining illustrations of warded keys 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 those 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 pickers 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 that it is a very common practice to cut more notches in the key than 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 any 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 locking and unlocking, which, in the moving either backwards 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 holes in the rim of the lock; the top 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 re-action of the spring will cause the notch b to hold firmly on the edge of the rim, from which it cannot be disengaged without releasing 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, wherein the second lever 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 as an essential feature in a lock protected by wards alone, to the explanation of one of the most important principles of applying or second principle of security, that 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 tumbler. 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, at e and f. 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 upper part of the tumbler is, like the bolt, divided into two parts, the front part, to which the bolt is distinguished in the cutting 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 e the tumbler is divided into two parts, the front part, to which 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 notch, the bolt cannot be moved backwards or forwards by any 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 often made a little lower than 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. It is evident that 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 its notch, but carry it little 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 from a very remote period. In the lock now commonly used in Egypt and Turkey, the bolt is secured by a number of pins, which, though contained in 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 a piece b, in which are a number of hollows, c, c, c, each containing a movable 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, 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, supposed to 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 'Encyclopædia Britannica,' appears to be extensively, or rather universally, employed for gates, doors, or 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 sculptured among 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 authorities, or in 1778, according to the 'Encyclopædia 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 which are based upon it, by the use of several tumblers, each of which must 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 were not lifted at all. To illustrate this, let a, Fig. 10, represent a tumbler pivoted at b, moved downwards by the action of a spring, not shown in the cut, at b,
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 1844, 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 so move 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 a very ingenious contrivance the proper key is only introduced 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 preparatory 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 applying moveable impediments very different to that adopted by Holland. Retaining the principle in which required, every such impediment should require its own peculiar movement, he provided for restoring them, by the application of an elastic force, to such a position should leave no trace of, and afford no possible clue to the discovery of, the extent of their motion under the pressure of the key, so that the opening of his lock without the true key is, to use his own expression, 'as difficult as it would be to determine what kind of impression had been made in any fluid, when the cause of such impression was wholly unknown; or to determine the separate magnitudes of any given number of unequal substances, without being permitted to see them; or to counterfeit the tally of a banker's cheque, without having either part in possession.'

To explain, more readily than could be done by a mere representation with the aid of words, the ingenious contrivance by which the above effect is produced, we may adopt, with some alteration, a diagram of a supposed apparatus illustrative of its principle, which is given by Holland from the original drawings attached to Bramah's specification. Let a, a, Fig. 13, represent, isomorphically, a frame in which is mounted the bar or bolt b, b, in such a manner that it is capable of longitudinal motion. In the nearer edge of this bar or bolt are cut fournotches, to receive the lower vertical sliders c, c, c, which, when they are in the position represented in the cut, serve to hold it immovable. In the
further edge of each of those sliders, however, is cut a notch of such size and depth, that if it be brought to the same level as the bar $b$, the bar will be capable of sliding through it. These notches in the sliders, shown by $1$, $5$, $9$, 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, which 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 these 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 each of them 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, $e$, $e$, and $f$, corresponding with, and capable of fitting on to the lower ends of the sliders $e$, $e$, 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 $b$. While the key, $g$, is held in this position, the bar $b$ may be slid backwards or forwards; but when the instrument is removed, 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 imaginary contrivance is applied in Druamah's lock, we must premise that the ordinary mode of shocking the bolt, by the action of the bit of the key, is entirely abandoned; 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 an elevation of a section of a street-door latch-lock, the central figure being a side view of the barrel, and the other representations of its back and front ends, respectively. In this cut $a$, in the side and back views, represents the lock; $b$ is the sliding bar, which, having been released from its own rotation, moves slowly along its axis, and is inserted, by its inner edge, in the slit or opening $b$ 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 the holes shown at its two sides, it is a moveable part of the lock. It follows that the barrel cannot be turned round unless the four sliders and its parts, in the order of their notation, may all tally with the edge of the plate, Fig. 15. Fig. 16 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 $b$ in 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 comes in contact with the sliding collar, compresses the spring, and thus 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 outer edge of each slider is brought to tally with the edge of the circular plate, which is represented as pushed in Fig. 16, 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 ordinary situation, in which they slide 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 very small key-hole, 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 small bit of the key, the main use of which is to cause the lower end of the right-angled plate which forms also a stop to prevent it from being pushed too far, and to indicate when the sliders are brought to the proper position. To prevent the sliders from working too loose, or from dropping in the manner of the false key, as they do in some locks, 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 attached to a watch-chain, is less likely to be missed, 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, while the production of a false key from an impression of the true key, or even from the key itself, would be an 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 no allusion has yet 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 has been aptly termed the invention of the "double locked," or, as it is sometimes called, the "broken" key. The pick, being placed in the barrel in such a way as to give it an inclination to revolve on its axis, the pickers 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 pressed until, by the revolution of the infinite resistance of the locking-plate, he found that its notch was 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 skill and dexterity, Mr. Russell 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 devised by a person named Kemp, who was then in the vicinity of Bramah's establishment, by the simple device of cutting one, two, or more additional or false notches on each slider, and enlonging, as shown in Fig. 15, the inner portion of each notch in the locking-plate. The result is that it is utterly impossible for a picker to know whether he gets the true notch, or one of the false notches, on to 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 barrel 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 the risk of picking is concerned, absolutely secure 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 tumblers and other ordinary locks.

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 sliders are used, but 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 may become infinitely large; and to the ordinary user, who may adopt the system in some cases, but is not likely to adopt it in others, this perfection of security will be a great inducement to the use of the brake. If his key be required to be of a single size, or to go into a series of locks of the same kind, and he is able to increase the number of sliders, the variety of locks will be increased in almost infinitum.

Bramah himself showed that if twelve sliders were employed the number of changes which might be produced by simply varying their relative positions, would amount to 79,001,500; while by 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. It may be observed that in the event of a key being lost, or broken, or any other accident occurring, on account of having been altered, it is possible to change the relative positions of the sliders, so as to render the old key useless; also that master-keys may be made, if required, by constructing a suit, or combination, of each of the sliders in every possible position of the two series of 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 position for the key. By any other arrangement it would be almost impossible to secure the required accuracy. Owing to the very small size of the protecting apparatus, the Bramah lock has been applied to many ingenious purposes, including the construction of lockers, suitcases, and other kinds of lock, and which we may notice the locking of liquor-cocks. Mr. Russell's contrivance for thus applying it is referred to under Cock, P.C.S., p. 385; and we see no reason why, for small cock-pipes, this arrangement should 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 wind up the lock and open it. 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 left in 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 his manufactory of locks, on a curious application of this invention to what he calls a "lock-protector," which, in fact, a scutcheon, or shield, adapted to cover the key-hole of a room door, and barring in the key, the combinations being produced by applying this scutcheon to a key-hole on the outside of a door, and turning its key a quarter round, two lancel-shaped pieces of steel are projected from a little box at the back of the buttscrew, in such a manner as to encroach into the opposite sides of the key-hole, and to hold the scutcheon 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 locks are opened. The chief object of this contrivance is to enable travellers at inns 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, but equal to five, six, or seven, of the number of sliders of the key. This kind of lock, 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 break open the key in this manner. 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 absolutely secure; and he adds that he has 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 added, was so small that it could not be exhibited, producing another like it. The lock is very simple and strong, and might, 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 the lock known often termed a puzzle-lock, which opens without a key, but is regarded rather as an ingenious toy than as an available substitute for locks of the more usual construction. In the common lock, of which the number of different combinations 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 round upon itself as an axis. The holes or apertures for inserting the keys are situated in every plate or position of the series of discs, and are so arranged that unless the whole of them are turned round to the exact 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 predetermine combination of which, 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 relative positions of the tumblers of the ordinary lock, 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 be known to persons from whom it is desirable to secure the lock. The Marquis of Worcester, in whose "Century of Inventions", 1790, a puzzle lock is described, which lay claim to the most marvellous properties, was, according to the passage, from the seventy-second article in the Century, to have devised an improvement upon this apparatus, as he refers to it in "a series of curious and ingenious locks, the locks of the properties of which he describes as being the same as the other, 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, 1800, is a description of an escutcheon of similar character, invented by Mr. Marshall, and rewarded by the Society in 1784, in which the escutcheon or door by which the key-hole is closed is held by a pin passing through a single circular aperture, 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 of metal, each 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 round within it, or held fast in any required position, at pleasure. The numbers, or letters, upon which the opening depends, are fitted to 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. 111-115, is a minute account of a lock invented by Mr. Ainger, in which, in addition to other ingenious features, is an application of the principle of permutation to a key, which, without any great complication, the means of not only rendering the imitation of the key all but impossible, but also of so throwing the key itself out of order, that there would be 512 chances to one against a stranger opening the lock, as against the Holland, then...
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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. It may be so close as to all appearance, shut properly, without the bolt shooting into its socket. To remedy these inconveniences, Mr. Bullock devised, and submitted to the Society of Arts in 1801, a very simple addition to the ordinary door-lock, consisting of an internal catch which detains the bolt when it is drawn back, out, is released the instant the door is thoroughly closed, by the pressure of a small projecting piece of metal fixed to the inside of the lock. Details of these are fully given in the Society’s Transactions, vol. xix. pp. 290-293.

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, with great strength of limb and agility, and, being gregarious, are thus enabled to commit great devastation, so that when a swarm has destroyed the vegetation of one district, they are enabled to take flight to and traverse another, and do considerable damage thereto. The migratory locust has occasionally visited England, and about the middle of the last century did some damage in many parts of our own country. In Southern Europe, the East and Northern Africa, there is not an uncommon sight of such swarms, which, swarming so vast as to destroy all vegetation, whilst the putrifying carcasses of their dead inflict the air. The Arabs and people of Nigrata use them 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 1566. He was entered at Trinity College, Oxford, in 1573, took a degree, and then, going to London, became an actor and play-writer. 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 Logge, his ‘Alarum against Uaures,’ which takes up incidentally the defence of the stage, was printed in 1588. The same year he was student of 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 Clarke and Cavendish. According to tradition he was unusually received by the historian of our early literature, this fiery person went through yet another change; for he is usually identified with a Doctor Lodge, who took his degree in medicine at Avignon, printed in 1626 a book on the Plague, and obtained a passport from the Privy Council to ‘travel into the Archdiocese of his 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,’ Lond. 1602, fol.; ‘Seneca’s Works, both Moral and Natural,’ Lond. 1614, fol.), he published novels, volumes of verses, and miscellaneous pamphlets; and he was a distin-
guished 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 Dodgley’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 Englande; made by Thomas Lodge, Gent, and Robert Greene, in Arthurs Magister,’ 1594, 1596, 1602, 1617, 4to.; a whimsical but animated dramatic essay, intended to close the line of Greene. But Lodge’s own exertions as a dramatist, although they en-
title his name to a place beside those of Greene and Peele, are less owing to us than the assistance which one of his works furnished to those of another. One of his novels, entitled ‘Rouslanye: Euphanes Golden Legacie; found after his death in his cell at Siloxeda. Bequested to Philantus Sonnes, nours up with their Father in England. Fetch from the Canaries; ’ 1590, 1592, 1620, 1623, 1642, &c., 4to., reprinted in Mr. Collins’s ‘Shakespeare’s Library,’ 1840. From this source come the closely the leading incidents (indeed many also of the minor ones), the grouping of the characters, and many of the strokes of portraiture, for his ‘As You Like It.’ While a perusal of the novel cannot diminish our admiration of the play, it is yet an ample duty.

In the midst of that which is unskilful, somewhat that is dull, and a good deal in the bad taste of Lyly’s Euphanes, his novel, the novel, though written by the man who, and in many pieces finely poetical, both in its prose descriptions and narrat-
vive, and in the interspersed 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. (Tenancy 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, for the terms of the tenancy, and of the condition of the notice being that of the term. Unless the lodger gives up possession paying the rent for a whole term in ad-
vance, notice must always be given, and he will not be released without discontinuing the payment of the rent. Thereby just, of his goods being distrained 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 and witnessed, it cannot be enforced.

Lodgers are entitled without special contract to the use of such things as, though situated in another part of the house, are necessary to their convenience, as the knocker, door-bell, skylight, &c.

It has been held that a covenant by the lessee not to under-
let, 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 lessee, it being considered that the occupa-
tion of the lodger is that of the lessee. The lodger however can resort to his right to recover against the lessee for the loss so incurred.

The 7 & 8 Geo. IV. c. 29, § 45, protects the property of those who are not occupants of the premises from perjury in making it felony for the person in occupation to steal or ap-
propriate any chattel or fixture allowed to be used in any house or lodging.

(For a relating to this subject see Woodfall, Landl-
ord and Tenant; and Coote, Landlord and Tenant.)

LOGAN, JOHN, was born at Fain, in the county of Edin-
burgh, in 1748. He was the son of a small farmer, and, being destined for the church, entered at the University of Edin-
burgh; 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 a little Ode to the Cuckow. 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 psalmody 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 aspiring, though unsuccess-
fully, to the Professorship of Universal History in the Uni-
versity. Outlines of a part of his lectures were published under the title of ‘Elements of the Philosophy of History, for Lectures on the Church, Vol. I.’ and ‘Notes on the Church on the Government, Manners, and Spirit of Asia;’ and a vol-
ume of Poems, which reached a second edition before the year was closed. Logan, not a learned divinity, or a very pro-
found thought, but a man of sound and practical education, 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 not called to indirect and the relief. In 1768 he

informed and caused to be seated in

Edinburgh a tragedy called. 'Ramsmead,' which had been rehearsed at Cockburn, but refused a licence by the Lord Chamberlain. This publication brought on him the anger of his Presbyterian associates; and other

annuities, aggravated by an hereditary tendency to hypo-

chondria, served to increase the fate of the poor from which

he quitted his parochial charge and repaired to London. There,

retaining by agreement a part of his clerical income, he ed-

cated his livelihood by literary labour, writing paper for the

'Edinburgh Review,' and contributing to the first of the series which was one "A Review 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 28th of December, 1748.

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 reprinted. They are among the most

scintillating that the Scot's has produced. Mr. Stockdale's Edition of his

poems, with an account of his life, appeared in 1805; and the

poems are included in Dr. Anderson's collection.

LOGARITHMS, Thirteenth Edition. The process was suggested by the celebrated Gauss for supplying an inconvenience connected with the use of logarithms described in § 21 of the following article. Though they have been suggested more than twenty times, they are only beginning to receive the attention which they merit.

If \( \log a \) and \( \log b \) be given, and \( \log (a + b) \) or \( \log (a - b) \) be wanted, the ordinary tables can only be applied by finding \( a \) and \( b \) from their logarithms, adding or subtracting them as found, and then finding the logarithm of the sum or difference. This requires three uses of the tables, and one process of addition or subtraction. Gauss's table substitutes one use of a table, and two processes of addition or subtraction. When the above necessity occurs only now and then, it may be hardly worth while to have recourse to such a table; but in any series of calculations in which the determination of \( \log (a \pm b) \) from \( \log a \) and \( \log b \) is a frequent constituent part, the table is a very great relief.

The construction of the table is as follows: There are three columns, styled A, B, C: the first, A, containing the

arvors of \( \log a \text{ and } \log b \text{, being } a \text{ and } b \) from their logarithms, adding or subtracting them as found, and then finding the logarithm of the sum or difference. This requires three uses of the tables, and one process of addition or subtraction. Gauss's table substitutes one use of a table, and two processes of addition or subtraction. When the above necessity occurs only now and then, it may be hardly worth while to have recourse to such a table; but in any series of calculations in which the determination of \( \log (a \pm b) \) from \( \log a \) and \( \log b \) is a frequent constituent part, the table is a very great relief.

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many any system of tables in part... There are many
reasons against our inserting the table of logarithms itself
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
addition and subtraction of quantities in the following
ascending scale 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, division 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:

\[ \log(A + B) = \log(A \times B) \]
\[ \log(A - B) = \log\left(\frac{A}{B}\right) \]
\[ \log(A^n) = n \times \log(A) \]
\[ \log(A + B) = \log\left(\frac{A}{B}\right) \]

3. The logarithm wanted is taken partly from a table,
partially from the one remembered rules. 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 \(21673.3\) has 3 as the log
arithmetic of its logarithm, and \(21673.3\) is the characteristic of \(21673.3\). It is very
common to call this the characteristic of the logarithm itself;
but it is better to find this application 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 con
tain by their position relatively to the decimal point. Thus \(21673, 21673, 21673, 21673.000000\), &c. are numbers
with different characteristics, or different integral portions in
their logarithms. But the fractional portions are the same in
the logarithms of all, namely, \(\log 3 = 0.53592\).

6. The characteristic of a number may be either positive
or negative. For our present purpose, it will be sufficient to
draw 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 thing as the subtraction of a negative quantity
(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:

| 8 and 5 make 3. | 2 from 3 gives 1. |
| 8 and 11 make 3. | 2 from 3... 5. |
| 2 and 7 make 9. | 3 from 2... 5. |
| 4 times 5 is 24; | 3 from 2... 1. |
| carry 8, which gives 21. | 8 from 3... 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 \(2791386\) is 3; that of \(17462\) is 4; that of \(20.137\) is 1;
that of \(9.899\) is 0; that of \(-7.63\) is 1; that of \(0.918\) is 2,
that of \(0.00007\) is 5.

8. It is worth while to remark that this broken rule, as it
seems to require subdivision only on account of the
notions generally attached to the decimal point, which is
treated as if it were one of the places of the number. But if
the decimal point were, as it ought to be, considered as part
and parcel of the number's place, so that \(12.84\), for instance, is
not \(1 \times 2 \times 8 \times 4\), but \(1 \times 2 \times 8 \times 4\), then the
two rules might be given under one, as follows. The charac-
teristic of a number is the number of places by which the
first significant figure is distant from the unit's place; and is
positive when that first figure falls to the left, negative when
to the right. Thus in 1284 • 567 or 1284 (• 6) • 567 it is 3; in
0.0009 or (0 • 0) 0009 it is 4.

9. A mixed number, such as \(5 \cdot 9274\), is thus multiplied
and divided:

\[ \frac{5 \times 9274}{6} = \frac{9274}{6} \]
\[ = 1546 \]
\[ \text{in multiplication, the multiplication of the negative figure}
\text{produces a negative result, and the carriage from the positive}
\text{part goes in diminution of this number. The last step is:—}
\text{6 times 3 is 18, and 6 is 15. In division, a divisible figure}
\text{must be sought above the negative characteristic, not below it;}
\text{and the first unit's place, from the last, must be afterwards carried
to the right in the usual way.}
\text{Thus when \(21116\) is divided by 5, the first step is:—5 is}
\text{contained in 25, 5 times, carry 4; then 6 is contained in 41,
8 times, &c.}
\text{5 \cdot 21116 = 115 \cdot 521 \cdot 1050 \cdot 606}
\text{5 \cdot 823 = 1 \cdot 929 \cdot 4 \cdot 361}
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\text{10. The decimal part of the logarithm is taken out of the}
\text{figures. These are not complete logarithms, which could not
be given, since the real logarithms are generally incommensurable
decimals. The only numbers which have logarithms capable
of finite expression (in the system commonly used) are those
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\text{5 \cdot 21116 = 115 \cdot 521 \cdot 1050 \cdot 606}
\text{5 \cdot 823 = 1 \cdot 929 \cdot 4 \cdot 361}
\text{10. The decimal part of the logarithm is taken out of the}
\text{figures. These are not complete logarithms, which could not
be given, since the real logarithms are generally incommensurable
decimals. The only numbers which have logarithms capable
of finite expression (in the system commonly used) are those
\text{5 \cdot 21116 = 115 \cdot 521 \cdot 1050 \cdot 606}
\text{5 \cdot 823 = 1 \cdot 929 \cdot 4 \cdot 361}
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 568 rather than 437). In the row 42, and under 7, we see 6304, and in the side table opposite to 6 in 6, and 6304 + 6 = 6310. Hence 6310 is the logarithm of 4275898*116, as far as the four-figure table will give it. Similarly the logarithm of 4 (which must be read 400) is 0696, that of 400 is 26835, that of .04179 is 27630.

To find the number to a logarithm, in the four-figure table, use the decimals of the logarithm with the antilogarithmic table in the manner as the four significant figures of the number 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 5.0324 is required, we neglect 5, and, going into the anti-table with .0324, opposite to .02 and under 3 we find 4198, and under 4 in the side table we find 4. Hence 4198 + 4 or 4202 are the first four significant figures of the number required; and its characteristic is 4; whence 4200 is the number to the logarithm, as near as the four-figure table will give it. Similarly the number to .0111 is 4.084, that to .0200 is .09477, that to .06000 is 391000000.

We give an instance of the application of each of the rules in § 2. Let it be required to find, as nearly as four-figure tables will do, 60; the product of 17789 and 80; the quotient of 17.293 divided by 942942; the eighth power of 1.9273, and the eleventh root of 79005565918. The processes are as follows:—

| Log. of 17789 (say 17800) | 4.2594 |
| Log. of 68426 (say 68430) | 4.8231 |

Log. of product 9.0572

Answer 1129000000 from the table.

Error 144059, about .0010 of the whole.

Again, log. 17.293 (say 17.29) 1.2377 Subtract log. .942942 (.9429) 1.9745 Log. of quotient 1.9769 Answer 18.33.

log. 1.9973 (say 1.997) 0.2849 multiply by 8

log. of (1.997) 2.2792 Answer 190.2.

In raising 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 00005565918 (say 000055659) 7.4748 Divide by 11 1.6133 log 000055659 Answer 4105.

14. Before beginning to use five-figure tables, it is advisable to practise the formation of the tenths of numbers not exceeding 50, in the head. For instance, which is the nearest integer to 7-tenths of 37. The process at length would of course be 37

10389

— nearest integer 26

5.9

It should be done thus: Having multiplied 7 by 7, and got 49, subtract the units, and carry 2 as the nearest number of tens. Then add 5 to 21 obtained from the three. When 5 units are thrown away, consider the ten next above as the nearest. Thus 9-tenths of 45 should be considered as 41, not 40, and 6-tenths of 17 as 9, not 8. Similarly, 4-tenths of 31 is 17; 3-tenths of 19 is 6. But 2-tenths of 32 is 6; 7-tenths of 42 is 3; 8-tenths of 25 is 2.

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 the first four significant figures in the table, and take the five figures of logarithm odd, as many tenths of the tabular difference as there are units in the fifth significant. Thus to find the logarithm of 011217, we find 1121 in the specimen, opposite to which is 45891, with 38 for a tabular difference. Now 7-tenths of 38 is 27, and 61 and 27 is 88; so .04988 is the decimal part of the logarithm. Similarly if the significant of the number 11223, the decimals of the logarithm are .05011; also 11201 gives .04966; 11209 gives .04957; 58332 gives .76591; 65906 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 next under 05016 is 04999, opposite to 1122. The unattained part is 17; the tabular difference 39; and 170 contains 39 4 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:—

<table>
<thead>
<tr>
<th>Number</th>
<th>Four-figure</th>
<th>Five-figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>17798</td>
<td>4.258037</td>
<td>17.92932987</td>
</tr>
<tr>
<td>63436</td>
<td>4.002027</td>
<td>9.49290917</td>
</tr>
<tr>
<td>1128900000</td>
<td>9.052649</td>
<td>18.83631295</td>
</tr>
<tr>
<td>205231</td>
<td>4.063156</td>
<td></td>
</tr>
<tr>
<td>283690</td>
<td></td>
<td>24.2220</td>
</tr>
<tr>
<td>1.9273</td>
<td>0.284895</td>
<td>1.000055699, 11.5742808</td>
</tr>
<tr>
<td>8</td>
<td>4.1044</td>
<td>6.153217</td>
</tr>
<tr>
<td>100:37</td>
<td>2.279600</td>
<td>61.3218</td>
</tr>
<tr>
<td></td>
<td>27.944</td>
<td>7.0940</td>
</tr>
</tbody>
</table>

20. 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 tens 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, to find the logarithm of 46517545, of which the first seven significant are 4651754, look in the table for 46517, and we have

<table>
<thead>
<tr>
<th>Table</th>
<th>459517542</th>
<th>6591787</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do.</td>
<td>do.</td>
<td>3</td>
</tr>
</tbody>
</table>

So the logarithm required, as far as seven-figure tables will give it, is 8.6581772.

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 of the logarithm of 45603 has the decimals 6599394, but that of 45604 has 6590296, not 6590295. Some mark is usually made to give warning that the change has taken place; but those whose work 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.

18. To take the logarithm of a given number 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 number-figures belonging to the attained part, and for 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 1.0590176:

\[
\begin{align*}
5065 & \quad \text{gives} \quad 6590125 \\
5 & \quad \text{gives} \quad 6590125 \\
3 & \quad \text{gives} \quad 6590125 \\
20 & \quad \text{gives} \quad 6590125
\end{align*}
\]

Number required 45.63533

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, involutions, and evolutions are not broken by additions or subtractions. Thus to calculate \( \sqrt[4]{a^b + c^d} \) we form for the logarithm of the answer

\[
\log (a^b + c^d) = 4 \left( \log a + \log b + \frac{c}{d} \right)
\]

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 the manner for the performance of the additions and subtractions (unless indeed the logarithms described in the next article be employed). Thus to find \( \sqrt[4]{a^b + c^d} \) it would be necessary, not merely to form the logarithms of \( a^b \) and \( c^d \), or \( 2 \log a + \log b \) and \( c - \log b, \) 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 something for the want of the seven more figures after the decimal point. Thus, suppose it required to find the logarithm of 11.374928. In the four-figure table 113 has 0531 and .77 adds 26. The next figure is 4, which, had it been the fourth significant, would have been carried to 15; but being 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 05576, 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 + 8, or 18, is added, giving 05654. Had 49 been read as 50, in the usual way, 10 would have been added. In the seven-figure table 11374 gives 0559192; 9 adds 845, the 2 should add the tenth of 77, and the 8 should add the hundredth of 305: hence 3 more should be added than arises from the figures 92. This plan may be carried farther, when the required accuracy is desirable, 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 300... has 301..., for the decimal figures of the logarithm. It is not 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 learned, furnishes one of the easiest modes of assigning the place of a decimal point in a common division. For example, in dividing 30017643 by 018416, the characteristics being 3 and 2, we shall have to carry 1 to 2, because the significant of the divisor is 18, greater than 17. Take 1 from 3, which leaves 2, the characteristic of the quotient, which has therefore -0 before its significant. 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, either to the argument and its quadrant (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 either for 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 falls into the common error of taking the wrong root. Thus the logarithm of the cosine of 84° 9′ in a five-figure table is 0.9082, and the tabular difference is 154, diminishing. Hence the log cosine of 84° 8′ is not 0.90828 + 0.00065, but 0.90829 + 0.00062. And if we ask for the angle whose log cosine is 0.90840, we find the next underneath this in the table to be 9.09328, and 2 for the unattained part. Divide 220 by 124, and 2 is the nearest integer. But the angle required is not 84° 9′ + 0° 2′, but 84° 9′ + 0° 2′, or 84° 9′ - 8.

27. The equation \( e^x = b \), in which \( x \) is unknown, is solved by taking the logarithm of both sides, which gives \( \log x = \log b + x \). The process may perplex a beginner when the quantities have negative integers. We therefore subjoin an example. Let it be required to solve the equations

\[
\begin{align*}
\frac{2}{3}x & = -0.0163 \\
182 & = -6
\end{align*}
\]

(The reader is supposed to know the complete interpretation of algebraical exponents.) We have then

\[
x = \log (-0.0163) + \log \left( \frac{2}{3} \right) = 3.21219 + 1.75696
\]

\[
y = \log \frac{182}{6} = 17.8715 + 2.26007
\]

Now throw the three logarithms which have negative integers into the more usual algebraical forms.

\[
\begin{align*}
-2.21219 & = -5.75696 - 1 \\
-2.26007 & = -7.7515 1
\end{align*}
\]

Or 1 - 2.21219 - 2.26007 = -0.998181.

And make the divisors, which give for the quotients 1 - 471, and -0.998181, or

\[
\begin{align*}
\frac{2}{3}x & = -0.0163 \\
182 & = -6
\end{align*}
\]

LOGGAN, DAVID, a line-engraver and designer, of considerable eminence in England in the time of Charles II., was born at Danzig in 1638. He appears to have first learnt his art from Simon de Pass in Denmark, and to have worked 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 *Haliae Academiae Oxoniensis Heroes ad Servitum*; Loggan is himself entered on the books of the University, in the matriculation registry there is the following entry —

*David Loggan Gedanensi, Universitatem Oxon. Chalcographus.*

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 Leicest-

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 George, prince of Denmark; the Duke of Albemarle; the Earl of Clarendon; the Earl of Argyle; the Duke of Ormond: the Lord Keeper Guildford; Archbishop Sanctor; 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 Newcastle, and Archbishop of St. Asaph. He engraved also three portraits of Charles II., in one of which the king is leaning his hand on Archbishop 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. Valk, and Peter Williamson; the first two came from Holland with Loggan.

(Vertue, *Catalogue of Engravers*, &c.)

LOGIC *[Organon, F. C. and P. S.]*

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 the 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 Semiramis, which obtained him a great reputation. He returned to Paris in 1649, and afterwards employed by Louis XIV., at the Tuileries and at Versailles. He painted two apartments in the Tuileries—the Antechamber of the Roy and the Salle des 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 (i. 31); Loir himself has made an etching of it. Another of his best works is the Palace of the Emperor Louis and 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 similar way, which did not pass so much for a genius alike. He died at Paris, rector of the Academy, in 1679. Loir's own etchings amount to 160 pieces, which, together with 50 engravings after his works by other artists, make a total of 239 prints. A portrait of the latter was engraved by his brother Alexis Loir.

Fellinien 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 matters. Fellinien and Loir were at Rome together, and Fellinien's dates have been for this reason adopted in this article, where they differ from those of D'Argenville and Gault de Saint-Germain.

(Fellinien, *Entretains sur les Vies et sur les Oeuvres des Peintres*, &c.; D'Argenville, *Abridge 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 Sustermann or Susterman, and, according to some, Lambert van Ouwerkerck. He is supposed to have been born in France, and his birth is equally unknown: it is said to be Liege or Amsterdam, more probably Liege, as he settled there after his return from Italy in 1658, and he died there in, 1660, aged fifty-four. Vase in the Tabet Collection, July 5, 1659, has Lanberry's name, distinguishing all of the Flemish painters, and styles him a great letterato, a judicious painter, and an excellent architect; but his account of him is contradictory; he had it from D. Lampertius, who wrote the pamphlet *de Vita Lucis in Latine*; it was published at Bruges in 1556, five years after his death. Lombardus studied under Jan de Maiause before he visited Italy. Frans Floris, Hubert Goltzius, and Willem Key were his scholars. His works consist chiefly of drawings with the pen in chiaroscuro; his coloured paintings are scarce; there are two or small dimensions in the Gallery of Berlin; there is a Pietà in the church of Pincensteck at Munich, which is to be attributed to Daniel de Votterra. Lombardus'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, Lombardy 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. Lombardus, and others Lam. Sussius; and it is not yet decided whether these names indicate one or two artists; Heincken considers them as two, and Van Mander and Van Syssius as one, making no allusion to Lombardus. In a note to De Yongh's edition of Van Mander, Sussius is styled the pupil of Lombardus.

Nachrichten von Künstlern, &c.; Fiorillo, Geschichte der Zeichnungen Kunst, &c.)

LONDONDCY, ROBERT STEWART, MAR-
QUESS OF, was born at the family seat of Mount Stewart, in 1724, and lived till 1798, (the same year which gave birth to the Duke of Wellington and to Napoleon Bonaparte.) His father, of the same names, after representing the county of Down for many years in the Irish parliament, was made Baron Stewart of Londonbury in 1769, Viscount Castlercagh in 1779, Earl of Londonderry in 1796, and Marquess of Londonderry in 1816—all in the peerage of Ireland. Robert was his only child that survived by his first wife, and was the eldest son of the 18th of Octob. 1769, Francis Marquess of Hertford, whom he married in 1766, and who died in 1770.

The estate of Mount Stewart was purchased by Mr. Alexander Stewart, father of the first marquis, who sat in the Irish parliament for the city of Londonderry. Before this the family were known as Stewarts of Ballylawn in the county of Donegal, 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 Stewarts: but the connexion appears not to be distinctly traceable, and is variously given in the several accounts.

The descent of the family is common enough, and, if anything, rather assumed to be, from Sir Thomas Stewart of Leuchars, who lived 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 that Earl of Galloway. John Stewart is stated to have emigrated to Ireland about the time of the death 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 of age when, on his father being raised to the peerage in 1769, he offered himself for the vacant seat in the representation of the county of Down, and was returned, though not without a severe contest, which lasted nearly three years, and is said to have been 25,000l. or 30,000l. Nor did he come in without pledging himself, in contradiction to what had hitherto been the family policy, to the cause of parliamentary reform, which had for some time been a popular watchword in Ireland. For three or four years, according to his word, 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 1788 or 1794; and it may be fairly considered to have been the result of a conflict with the more alarming aspect which popular politics in Ireland were every day assuming. Up to this time he appears to have been universally regarded as an unusually amiable and agreeable young man; after his elevation to a peerage, his candor was commonly represented as a prodigy both of perspicuity and heartlessness.

In the summer of 1794 he was returned to the British parliament for the borough of Tregony, and, after remaining absent for a session he made his maiden speech in the House of Commons in seconding the Address on the 29th of October, 1795. 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 unassuming speaker; at one time rising above, at another time—sometimes on the same night—falling below his ordinary or average style of execution in a degree so considerable as to be creditable, and the greater wonderful in a person of so much nerve and self-possession.

He does not appear to have ever spoken again during this parliament, which was dissolved after the close of that of its sixth session, in May, 1796. That year he became Viscount Castlercagh; and he was again returned to the next British parliament, which met in September, for the borough of Oxford. But he returned his seat in July, 1797; upon which he was re-appointed 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, and remained in the office till 1812; and from that date 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 returned to the English House of Commons in 1796, for one of the new offices of 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 principally caused by the dismissal of the late marquesses from the command of his militia regiment and the lord-lieutenancy of the county for his opposition to the Union.

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 Addington administration. After Mr. Pitt returned to power, Viscount Castlercagh 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 Elgin. 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, with a new ministry, he was returned for the borough of Plympton Ernes.

Upon the dissolution of that ministry, in April, 1807, Lord Castlercagh 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 regarded as the undisputed leader of the opposition to 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 Mr. Castlereagh, 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, however, some delay was necessarily involved in the formation of committees of the Commons which charged Lord Castlercagh, 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 Castlercagh 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 once more returned as representative for the county of Down; and he also retained that seat in the next two parliaments, which met in August, 1816, and in April, 1820. The return to office of Mr. Canning, however, in 1816, had relieved him from some of the responsibilities of the public business in the House, till that gentleman again retired in 1820.

Meanwhile in the end of the year 1813 Lord Castlercagh had gained a great victory. France having opened with the French government at Chatillon, which however broke off after 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 as these, his fine presence and grave manner showed him to be the equal of any of his predecessors in the same station; and 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 the reign of the present King of England; and was succeeded by his son, Viscount Castlercagh, by the death of his father on the 8th of April, 1821.

Lord Londonderry died by his own hand at his seat of North-Croydon Place, in the county of Kent, on the 12th of August, 1822, at the age of 72. He was occasionally observed for some months, and for a few days before the melancholy catastrophe his extreme irritability and the symptoms of a morbid mind were discernible; and from that period the notice of his domestic 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. I have no doubt he is very unwell; he appears to me to have been exceedingly harassed, much fatigued, and gro-

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worked during the late season 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, in which society and the title went to his half-brother, the present Marquess.

There was no brilliance of intellect in Lord Londonderry, scarcely even the ordinary amount of literary cultivation and taste. But speaking the truth, he had sometimes, perhaps, been always inelegant and slowly, and occasionally so to a ludicrous degree. To any acquaintance with the philosophy of politics he made no pretension; nor did even the ministerial in victor in the contest. But he had great business talents; and that qualification, with his charm of manner, fitted him admirably for managing men, and was the main secret of his success in life. Something too, however, is to be attributed to certain moral qualities which he possessed. Whatever difference of opinion might be entertained about some of his political proceedings, or acts done in his political capacity, his personal character admitted by all who knew him to be that of an honourable and high-minded man, upon both whose firmness and fearlessness every reliance could in all circumstances be placed. His integrity in the great and highest walks of life might almost be said to contrast with the amiss of his manner.

(Memoir in Annual Register for 1822, which, however, abounds with omissions and inaccuracies; Parliamentary Hist. of George IV, vol. 4.)

LONGHI, GIUSEPPE, an Italian painter, and one of the most distinguished engravers of the nineteenth century, was born at Monza in 1766. His father was a silk-mercer, and from his own hand the boy, Giuseppe, was taught engraving. At the age of twenty, Giuseppe was finally placed with the Florentine Vincenzo Vangeliati, professor in the Brera at Milan, under whom he learned engraving. He studied afterwards some time in Rome, where he became acquainted with Raphael Menga, one of the best Italian engravers of that time. After having worked as a very celebrated engraver; and Longhi soon obtained a reputation himself by his print from the Genius of Music, a picture by Guido in the Chiigi Palace. It was then that, as the pupil of one of the chief employed in miniature painting, until he was ordered by Napoleon to make an engraving of Gros's portrait of him; and he was appointed about the same time (1798) to succeed Vangeliati, deceased, as professor of engraving in the Academy of the Brera, to which, during Longhi's professorship, many distinguished engravers of the present time in Italy owe their education. It was one of Longhi's first principles to make the monosubervient to the end, and not the end to the means: he always depreciated cleverness of line as a principal object, and in his own works manual dexterity is invariably subordinate to conforming to the general character, colour, and texture of the original, and the etching-needle was accordingly his chief instrument. He excelled in light and shade. Among his principal engravings are: The Baptism of Christ, the Oath of the Sposaitoli, 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 Dago, after Da Vinci; Galatia, after Alban; and many heads, after Rembrandt. The Sposaitoli was engraved as a companion-piece, or pendant, to Morghen's large print of the Transfiguration, by Raphael. He commenced in 1827 to engrave the Last Judgment, by Michelangelo, from a drawing by the Roman painter Minardi, but he died without finishing it: it was however considerably advanced, and, if not already finished, will probably be completed some one of his distinguished pupils. The Madonna del Dago, a tapestry by Raphael, Longhi also left unfinished, but it was completed in 1834 by his pupil the Cav. Toschi. 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 Calceograpia'), which has been translated into German by C. Harth; and contains a Life of him, by F. Löhren. 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 Kunsthstift, and in Nagler's Neues Allgemeines Lexikon. (3.)

LONGICORNES, the fourth family of tetrarmorous Coleoptera in Latreille's arrangement of insects. It includes a vast number of large and beautiful beetles, all remarkable for the length of their abdomen, which in many species are several times longer than their bodies. They inhabit woods, where the females deposit their eggs beneath the bark of trees, effecting the operation by means of a long, strong, horn-like ovipositor with which they are provided. The females are usually larger than the males. The larva lives beneath the bark of trees, according to the species in which it is found, and does much damage. The greatest assemblage of species and the largest forms are found in South America; but longicornes beetles are very generally dispersed. This family is divided into three great groups of which the genera Fruina, Cerambyx, and Lepista are the respective types.

LONC/ERA, a genus of plants named after Adam Lonicer, a German botanist, who was born in 1527 and died in 1556. He practised as a physician at Prague and later at Frankfurt-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-cleft usually irregular limb; 5 stamens; a filiform style, a capitate 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 Loniceræ, most of which have handsome flowers and emit a delicious perfume.

L. caprifolium, Goose-leek, or pale perfoliate Honeysuckle, has white whorled terminal and sessile flowers, deciduous leaves, glabrous; the leaves glabrous on both sides, the young leaves puberulous. The petals are pale perfoliate, the style glabrous. It has a twining stem, with white or purplish flowers and orange-coloured berries. It is a native of the middle and south of Europe, and is found in woods and thickets in many parts of England and the south of Scotland.

L. Periclymenum, the Woodbine, or Honeysuckle, has climbing branches, the leaves all separate, deciduous, somewhat downy, glabrous; the flowers subtended, sometimes the calyx-limb at the base, upper ones the smallest; the heads of flowers all terminal ovate, imbricated; the flowers fragrant. The flowers are pale yellow, the berries red, and accompanied with permanent bracts. This plant is in early times used for the suffers of the brain, and for serious powerful medicinal properties, but it is not now used. It is however extensively cultivated in the gardens and shrubbery 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 ogilante.' This plant has obtained the name of woodland, a corruption of wood-bine, from its habit of twisting round the stems of trees.

Thus Shakspere says—

So hath the woodbine, the sweet honeysuckle, 

Gently winded through the maple.

The name honeysuckle is derived from the habit of children, who draw the corolla out of the calyx, and suck the collected honey from its nectar. Several varieties of this plant are recognised by botanists. All these are beautiful climbers and twining stems, some with fragrant scents, and others, as the polyanthus; a pole, or climbing and rambling amongst bushes, are very ornamental in gardens. It is a native of middle Europe, and very abundant in some parts of Great Britain.

L. Xiphiodes, Fly Honeysuckle, has 2-flowered woody peduncles as long as the flowers, the calyx-limb deciduous, the berries slightly connected at the base, the leaves oval, downy, the stem erect. The flowers are of a pale yellow, and the berries are scarlet. It is a native of nearly the whole of Europe, in thickets, hedges, and rocky places, and by the side of woods. It is found in the same situations, but is a rare plant, in Great Britain.

L. Tartarica, the Tartarian Honeysuckle, has a glabrous erect stem; cordate-ovate sub-acute leaves; the peduncles shorter than the leaves; the berries distinct when young and nearly globose, but at length connate at the base; flowers rose-coloured, short, somewhat gibbous at the base; the fruit black with one of the berries usually abortive: the peduncles 2-flowered. It is a native of Tartary, and is one of the most hardy of European shrubs, growing in the open air in the gardens of Petersburg and Stockholam. It is very common in British gardens and is valued much on account of its early leafing and flowering.

L. Therica, the Georgian Honeysuckle, is an erect plant with petiolate, cordate, roundish, tomentose or pubescent leaves; the peduncles 2-flowered, shorter than the leaves, the bracteoles oblong, eliased; the berries globose, blood-coloured, joined together to the middle globular, hairy, and the seeds bear a hairy coat...
LOMBO. [WEAVING, P. C.]

LOPHIADAE, a family of Acanthocephalans, named

Fecundus pediculatus by Cuvier. Their pectoral fins are so

constructed and placed as to perform the office of feet. The
Lophius piscatorius, or fishing-frog, is a British example.

Lophobranchii, a family of fishes in which the
gills, instead of being separated, are separated into small
round tubs, which are arranged in pairs along the branchial
arches, and covered by a large operculum, so fixed as to leave
only a single small orifice for the passage of the water out-

wards. The pipe-fish, Syngnathus, Hippocampus, Solenol-
atumus, and Pegasus, are the genera included in this family.

LOPHOTES. [TAXIODES, P. C. S.]  

LORANTHUS (from lorum, a 'strip of leather,' and
delos, the wound, referring to the wound-like linear
shape and leathery substance of the petals), a genus of plants the type of
the natural order Loranthacae. It has discotic or hermaphro-
dite flowers, the calyx cup-shaped, adnate, with an entire bor-
der of scales, the petals 6, linear, reflexed, and the stamens inserted
inside the middle of the petals; the filaments short, anthers glo-
bos; the style thickish; stigma simple; the berry globose, 1-
celled, 1-seeded. The species are evergreen shrubs para-
sial or arboreal.

1. Europeus, the European Loranthus, is a graceful much
branchied plant; the branches terete; the leaves opposite, petiole, oval-oblong; the racemes terminal, simple; the flowers without a]

LORDS ACT. [INSOLVENCY, P. C.]

LORENZETTI, AMBROGIO and PIETRO DI, two celebrated Italian painters of the four-

teenth century, were born at Siena about the year 1300.

They were brother, as we learn from the following inscrip-
tion formerly in the hospital of Siena: ' Hoc opus fecit Petrus
Laurenti et Ambrosius cujus frater, 1320.' It was attached to
pictures of the Presentation and of the Marriage of the Virgin,
which were destroyed in 1700; and was preserved by the
Cav. Pecini. This inscription explains the name given by
Vasari to Pietro, whom he calls Petrus Laurenti or Laurati,
which is evidently an erroneous reading of Petrus Laurentii —
Pietro di Lorenzo.

Some works of these painters still remain, though
the principal of their works, by Ambrogio, which is described
by Ghiberti (in Cod. Magliabecchiani, f. 8 & 9), is do-

stroyed. It was painted in the Mihorie convent at Siena,
and on the walls of the cloister, in the shape of saints, and
monks. In the first compartment a youth was represented
putting on the monastic costume; in another, the same youth
was repainted with several of his brother monks about to
set out on foot, and conversing about missions. In
these missions are already at their place of destination,
and are being chartered in the Sultan's presence, and are sur-

rounded by crowds of crowds, and the Sultan judges them to be hanged; 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 is surrounded by hounds and horsemen; after the execution follows a great
storm, which is represented in all the detail of wind, hail,
lightning, and earthquake, from all of which the crowd are
protected by the Sultan and his nobles. For this picture it was
considered, is the cause of many conversions to Chris-
tianity. Such is the description of this picture by Lorenzo
Ghiberti, the first sculptor of his time, and he finishes it by
declaring it as a painted story of some perfect things: 'per una storia piu mi pare una maravigiosa cosa;' many
of the actors, he says also, appeared to be living beings.

There is still in the Sala delle Balestre, in the public palace
of Siena, a tempera painting of Peace, represented by a woman
within and without the city of Siena, with numerous inhab-


tants variously occupied in business and in pleasure. War
was likewise represented in this hieroglyph, but is now defaced;
there are however other allegorical works still remaining,
and Rumohr observes that what remain justify Ghiberti's
praises of what have disappeared, speaking with relation to
the time of their production, 1336.

Of the several pictures by Ambrogio Lorenzetti mentioned
by Ghiberti, only one remains—the Presentation of the Virgin
in the Temple, in the Scuole Regie, and in this some of

his works are equal to his earlier subjects. The Danae of

Ghiberti does not mention any works by Pietro Lorenzetti,
and there is only one authenticated work by him; it is in the
Sanza del Filone, a room against the sacristy of the cath-

dedral of Siena, an inscription on the wall over it says:

LORANITII, A. M. CIOCULLI.' It represents, according to Rumohr,
some passages from the life of John the Baptist, his birth,
etc. Vasari mentions many works by Pietro in various cities of
Tuscany, where he says his reputation was greater than

in Cinabre'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 Lasinio's 'Pitture del Campo Santo di Pisa.'

In 1314 two paintings, one of the Nativity, and another of
the building of 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 preserva-

tion in the time of Vasari, who completely restored them.

They speak 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 prevai-
ling style in Italy previous to Donatello, Masaccio, and Ghi-

berti; and they display even some of the barbarities of the
lyceum school. Several pictures are attributed to them in

various places and collections, but wholly without evidence as to their

authorship.

(Vasari, Vita de' Pittori, &c.; Della Valle, Lettere

Sacer, Lanni, Storia Pittorica, &c.; and especially Rumohr,

Italiane, and Cambiaso, in which the two Lorenzetti are

treated of at considerable length.)

LOSS ISLANDS. [SIEGRA LEONIS, P. C.]

LOTO, one of the poets of Greece in the early

sixteenth century. He is supposed to have been one of the

scholars of the Bellini, and also an imitator of Léonard da

Vinci. He lived long at Bergamo and was generally con-

sidered a native of that place. ' but,' says Lenz, ' we are

deluded to Sig. G. Beltramanni for showing, in a work published
in 1600, that Loto was a native of Venice? he found him
thus noticed in a public contract, ' M. Laurentius Lottus de

Venetia nunc habitator Bergamii'—Master Lorenzo Loto,
of Venice, now a resident of Bergamo. Loto lived also some
time at Treviso, at Recanati, and at Loretto, where he
died. His works range from 1518 to 1554. Lanti ventures

an opinion that Loto's best works were perhaps those

written by Raphael or by Correggio, if treating the same

subject. His masterpieces are the Madonnas of S. Bartolomeo,
and Santo Spirito, at Bergamo.

Pittori, &c.; Tassi, Gerga, &c.; Lanni, Storia Pittorica, &c.

LOVAT, LORD. Simon Fraser, afterwards Lord Lovat,

was born in 1806, at Beaumont near Inverness, in Scotland.

He belonged to a distinguished family of the Fraser clan as
early as the reign of Malcolm IV. about 1158, and

who had large possessions in Tweeddale and elsewhere in the

south of Scotland. Since Simon Fraser's fat of something infi-

in every year. After receiving the usual instruction at a

grammar-school, he was sent to the University of Aberdeen,
Loudon, John Claudius, was born at Cambuslang, in Lanarkshire, on the 8th of April, 1783, where his mother's only son was the Rev. Dr. Claudius Buchanan, author of 'Christian Researches in Asia,' then resided. His father was a farmer, and lived at Kersel Hall, near Gogar, about five miles from Edinburgh. As a child, Loudon exhibited an extraordinary delight in the sight of a garden, and a readiness to doze in the arms of his nurse, if not actually fast asleep, the sight of a pleasure was in nailing walks and beds in a little garden his father had given him. He was early sent to reside with an uncle at Edinburgh, where the boy was strongly recommended for education, 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 masters the compliment of understanding among the traditions 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 of botany and chemistry, and to the added agriculture, in the university of Edinburgh. During this period he acquired the habit of sitting up two nights each week for the purpose of study, a habit which he continued for many years.

In the year 1809 Loudon first came to London, 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 form of a paper contributed to the 'Literary 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, and Loudon was one of the first to introduce plants. This practice the author strongly condemned, and recommended the lighter trees, as the oriental plane, the sycamore, the alder, and others, which are now generally cultivated, and add greatly to the beauty of London squares. 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 1806, and published a small work, entitled 'A short Treatise on Some Improvements lately made in Hothouses,' 8vo., Edinburgh. In 1806 he published his 'Treatise on the Management of 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.

In 1806 an accident turned his attention to farming. Travelling one night on the outside of a coach, exposed to the rain, and neglecting to change his clothes, he became attacked with rheumatic fever, which left him so debilitated that for the sake of his health he took lodgings at Pinmer near Harrow. Here he had an opportunity of observing the inferior farming then practised in England, and persuaded his mother, who was joint-proprietor of the estate, with which she was conjointly with his father, they rented Wood Hall, and such was their success that the following year Loudon wrote a pamphlet entitled 'An immediate and effectual Mode of raising the Rent of the Landed Property,' 8vo., London. Published by a Scotch Farmer, now farming in Middlesex. This led to his introduction to General Stratton, 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 1809 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 for the pursuit of wealth, 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, and accompanying the Emperor 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 that the chief part of his capital had been lost 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 in order to complete his knowledge of ornamental 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 Encyclopædia...
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 reputation of 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, and on the same plan, as "Collections of Gardeners' Specimens," of which the second volume was published in 1826, with the title "Encyclopædia of Agriculture." Another work, though not exactly on the same plan, but similar in design and comprehensiveness, was edited by him, and published in 1825. This was the "Encyclopædia 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 "Arboretum et Fruticetum Britannicum," comprehending an account, with engravings, of all the trees and shrubs growing wild or cultivated in Great Britain. This work was brought out in three volumes, 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 subscriber, the engraver, and that he 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 death.

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 "Gardener's Chronicle," which was issued until 1836, 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 "Arboretum," 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 ankylosis of his left knee. Subsequently his right arm became affected, and the years that followed were full of trysmal remissions. In 1824 his arm was induced to submit to shampoing, during which process his arm was broken so close to the shoulder as to render it impossible to have it set in the usual manner; and on a subsequent occasion of this kind in 1825, it was thought necessary, in 1826, to have recourse to amputation. In the meantime his left hand became affected so that he could use only 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." The 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 all his writings. In his work of gardening he displays great anxiety for the mental improvement 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 is entitled "Self-Instruction for Young Gardener." 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.

The "Gardener's Magazine," in its first number, 1826, has a notice of a daughter. Mrs. Loudon is the authoress of "The Mummy; 'Ladies Flower Garden;' 'Ladies Botany,' etc. 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.
Lowell Statistics, January 1, 1845.

Capital stock ........................... $10,850,000
Number of mills, exclusive of print-
works, &c. .................................. 38
Spindles ................................... 204,076
Looms .................................... 6,304
Females employed ........................ 6,320
Males employed ........................... 2,415
Yards made per week ....................... 1,493,100
Bales of cotton used in ditto ............ 1,175
Pounds of cotton wrought in ditto ...... 464,000
Yards dried and printed ditto ......... 287,000
Tons of anthracite or per annum ....... 12,000
Cords of wood per annum ............... 3,270
Gallons of oil per annum ............... 64,842
Flour for saws, barrels, per annum ........ 4,000
Charcoal, bushel per annum ............. 69,000
Yards of cloth per annum ............... 75,873,200
Pounds of cotton consumed ............. 24,128,000

A pound of cotton averages 31.5 yards; 100 lbs. of cotton
will produce 89 yards of cloth. Average wages of females,
dear of board, per week, $1.75 dollar. Average wages of
males, clear of board, per day, 70 cents. Average amount of
wages paid per month, 138,500 dollars.

Lowell, as it was and as it is, by the Rev. Henry A.
Miles, 1860., Lowell, 1845.; Americans Almanac, 1846;
Knight's Weekly Volume, vol. ii.)

LOXONEMA. A group of spiral Gasteropoda is thus
named by Phillips. The species occur in Silurian, Devonian,
and carboniferous strata. (Pulmonata Forst. of Devonshire.)
LOYOLA, IGNATIIUS, Don Illego Lopez de Recalle,
more generally known under the name of Loyola, was the
youngest child of Don Bertram, lord of Oneya and Loyola,
a nobleman of high birth and distinction in his province, and
of the family of Herrn Schi de Dali. He was born in the year 1491, 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 Isabella, in the quality
of a page; but the vivacity of his dissmetatião 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 yoke of the infidels, rendered him desirous
of emulating their heroism. His father, when the abortive
rebellion of the Basques, in the court of Spain, had placed him under the care of his relation
Don Antonio Marques, duke of Najars. This nobleman,
perceiving the military bias of his young ward, got him
instructed in the art of war, and afterwards received him in his
suit. The ardent imagination of Ignatius was in the meanwhile kept in constant excitement by the eager perusal of the various romances in which were idealized the religious spirit of Spanish chivalry; to this was added the example of his brother, who, following with delight the profession of arms. After joining the army he soon rendered himself conspicuous by his gallant bravery on every occasion; his conduct, in other respects, is described as having partaken in all the qualities generally incident to a useful life; one vice, however, that of gambling, he appears constantly to have avoided.

He was in his thirtieth year when he assisted in the defence of Pampeluna, against the French; in the assault he was wounded and his right leg had been fractured by a cannon ball, and his left, at the same time, injured by a splinter. The French, into whose bands he had fallen prisoner, respecting his misfortune and admiring his bravery, had him conveyed to the castle of Loyola, which was situated at a small distance from Pampeluna. A long and painful confinement was the result of his wounds, and a cruel operation was resorted to, which, though endured with characteristic courage, reduced him to the last extremity. His recovery from the effects of the operation, though he saw in it a miracle, appears to have produced no change of conduct. A second operation, however, became necessary, owing to the inconvenience which had resulted from the first, and the consequences entailed a longer and more tedious confinement. To relieve his weariness he requested to be provided with those records of ancient chivalry which had been the delight of his leisure time, but instead of being furnished with works of mystic devotion and the lives of saints. Of a disposition naturally visionary and romantic, deprived of the means of pursuing a career in which he hoped to attain the highest distinction, the attentive perusal of the zeal and suffering of holy men infused in his mind an ardent desire to imitate them. As he eagerly pondered over the recital of the actions of St. Dominick, or of St. Francis, he was wont to say to himself was prevented him from imitating their deeds? But often were these heavenly aspirations clouded by the intervention of worldly thoughts and of temporal affairs. At other times, when in this spiritual combat the insatiable desire of a mystic vocation or an acute imagination would portray to him visions of celestial glory, in that hour of struggle, encouraged and inspired him. He has graphically described the various scenes through which he passed in his introduction to a religious life, in his 'Spiritual Exercises,' the origin of which may be referred to the same time as his first awakening from worldly alimony. This remarkable work is not a book of doctrine, it is the description, to use his own words, of the longings of soul seeking to be appeased, not by much knowledge, but by the scene and relish of inward things. He first minutely details a variety of rules for the guidance of spiritual life; he then expounds the sacred history, and frequently gives a fanciful interpretation; he afterwards gives an allegorical representation of the convert's progress from the primitive state to the realms of celestial bliss. Loyola but detailed his own feelings and actions in this extraordinary life. From this time all his desires were directed to one great object, an entire devotion to the service of God. For this purpose, renouncing worldly pursuits, he took himself from the paternal home, from his kindred, and from his friends. Regardless of the kindly opposition of his eldest brother, become by the death of his father he head of the house of Loyola, he resolved upon retiring to a Benedictine monastery at Mount Serrat, in order to prepare himself for a pilgrimage to the Holy Land. He became acquainted in that monastery with one of the brothers named John Chamoues, of high reputation for his piety and zeal, who was anxious to unfold to him the confession of his former sins and the confidences of his religious aspirations. While journeying towards Mount Serrat, he arrived at a village at the base of the hill on which the monastery stood, and which he thought to be the

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 in which he had found shelter for 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 was unable to walk the streets without an important admittance 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, his hours of solitary meditation, and his alternate fasts 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 fastings, 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 an 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 good and evil; he had taught us in his 'Spiritual Exercises' the method of informing the soul of its own weaknesses and the soul being gladdened by the one and depressed by the other. One day, at length, he awakened as from a dream, his imagination had portrayed to his mind the visible representation of heaven and hell. When he was in the midst of this vision, he poured down the blessings vouchsafed to him, and, refreshed in spirit, he arose a new and a mightier man.

After residing ten months at Manresa, he left that town for Barcelona, in order to return to Rome. In that city he remained a few days, in order to obtain the blessing of the Pope Adrian VI. upon his enterprise; he then resumed his journey, passing through Padua and Venice, travelling alone and on foot, farther and farther from his native land. His voyage from Venice to Cyprus presented a fresh trial for his patience and constancy, his pious efforts for the conversion of the crew of the vessel in which he sailed being met by a most unmerited and even hostile reception from the people, with some pilgrims for the Holy Land, and reached Jerusalem on 4th September, 1523. He there visited with holy veneration the hallowed spots which religious tradition has consecrated. To accomplish the objects of his journey, he was deaasional not only of contributing to the edification of the believers, but also to the conversion of the infidels. His projects, however, were defeated by the refusal of a concession of residence from the primates of the Church at Rome. He then re-embarked for Europe, and arrived at Venice in January, 1524, and from thence he returned to Barcelona. In this town he determined upon making some new arrangements, and, on the 2nd of January, 1524, he was present at the Council of Trent, where the conversion of souls. He addressed himself for that purpose to Jerome Ardelela, while a pious lady, Isabella Itzel, undertook to provide him with the necessary means. His career for educational reform was in a primary negligence. A camp had obliteraied from his mind the little he had learnt. At the age of thirty-three, he began with zeal to industry to apply himself to the rudiments of grammar. But his active mind found extreme difficulty in applying itself to its tedious minutiae; and absorbed in religious contemplation, each word he met with excited a train of pious thoughts. Still by constant application he appears to have made some progress in learning. He continued at Barcelona till the zealous attempts on his part to reform some irregularities which existed in a convent of nuns exposed him to the vengeance of those who had been the cause of his removal. He returned to the University of Alcalá, which had lately been founded by Cardinal Ximenes, in order to prosecute his studies. A religious address which he delivered to the students was the occasion of his being dismissed; but University reform and theology during four years, before he could again be permitted to teach in public, was imposed upon him. In 1527 he retired to Salamanca, where, having imprudently resumed his public exercise, he was again punished by the condemnation of the Inquisition, and dismissed him from his city with a similar injunction.

Discouraged by the rude reception which his pious labours had met with, and weary of his native country, he determined that time the most renowned seat of learning in Europe. He arrived in February, 1528. The slender means which had been provided for him by the charitable generosity of his
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 recommence his rules of grammar and the principles of philosophy before he could be admitted as a theological student, he buried himself in the class of the youngest and least advanced scholars, and besought their teacher to treat him as one of them. His time in Paris appears to have been spent partly in laborious acquiring the knowledge of a degree, and partly in the endeavours to obtain a salutary influence over his companions. In the latter pursuit he was eminently successful. Two students shared his rooms, Peter Faber (called Le Fève in Art. Januar.), a man of singular manners, and Francis Xavier of Navarre, of noble ancestry and aristocratic demeanour. These young men, of such different dispositions and habits, were the first-fruits of Loyola's labours. 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 Jasovra, F. C. On 15th August, 1534, they assembled together at the Church of Montmartre, in one of whose subterraneous chapels Faber, who was a prior, admitted to this noble society the two companions. They then took the solemn vows of chastity, absolute poverty, devotion to the care of Christians, and to the conversion of infidels. They further resolved on proceeding to Jerusalem, but in case this project 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 Society of Jesus, and in all ages, those three companions have 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 encountered, the unity of its purposes and the rules and constitutions by which it is governed, are fully and clearly detailed in another part of this Cyclopaedia. [Jasovra, 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 See of Rome. They were gratefully accepted by the reigning pontiff, who gladly availed himself of the support of a society of men full of zeal and enthusiasm, and bound together by the common tie of implicit obedience. In consequence of the open schism and lurking disaffection, the Church of Rome found an unexpected source of strength in her own bosom, a source enriched by the conversion of Ignatius Loyola (Iallam). On the 27th September, 1540, Paul III. published a bull sanctioning, under some limitations, the establishment of the Order; another was finally issued in 1543, 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 become Christians, which was called the asylum of Girona, to be founded at Gandia in Spain; the statutes were drawn up by Loyola, and the same privileges were accorded to it which belonged to the universities of Alcala and Salamanca. Not twenty years had elapsed since Ignatius left Loyola, when a poor and despised student, had been consecutively expelled as a factious and illiberal pretender. On the 31st July, 1556, this extraordinary man, worn down by wounds and sickness, was left in the world which for so many years he had looked upon only as the scene of charitable labours. It was a useless task to attempt a delineation of Loyola's character; it is best known by his works. Whatever differences of opinion may be entertained respecting the order of the Jesuits, there can be but little respecting their founder.

The memory of Ignatius was consecrated by a ceremony known in the Church of Rome by the name of Beatification, performed by Pope Gregory XVI. in 1842. His festival is celebrated on the 31st July.

His life has been written by Gonzales and Rhaddincz, a man of his early companions, the latter his friend, and by Maffes in Latin, Bertiy and Bonhans in French. His 'Spiritual Exercises' were published at Rome in 1548, and have been translated into French by Drouet de Maupertuis and Clément. His 'Maxims' were translated published at Paris in the year 1638.

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 1566. 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 Fleuray,' vol. xxvi.; De Tho, 'Hist. Universello,' 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 manner.

LUC'A-NIDJE, 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. They are a genus of Insecta, and appear to have been already known to the ancients. Their mandibles are prolonged to the entire length of the body, and in the Lecanus curvus of our own country are very formidable instruments of offence. They live in the day in the trunks of trees and old wood, and take flight at the approach of a man. The Four O'clock, or the Ox-eye have numerous to the males, which fight with great ferocity among themselves for possession of their mates. The larvae, which is supposed to have been the animal called Cosmos by the Romans, and esteemed as a delicacy by them is a poisonous insect. 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 over the visible portion of its life as a perfect insect. Some of the foreign genera of Stag-beetles are remarkable for their brilliant colouring. 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, Roesel, and Hope.)

LUCERNAL MICROSCOPE. This is a hollow pyramidal box, of wood, at the smallest extremity of which is a tube carrying the usual system of lenses for magnifying objects. At the larger end, which is towards the observer, there are two lenses in whose axles, and the smaller of which is at the small lenses at the opposite extremity, being coincident with the axis of the box; and between the exterior of the two lenses the eye of the observer is placed, who by means of a perforated card, or a piece of paper, or a small frame as usual, and is placed in a grooved 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, 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 first described in 1786. He intended his microscope 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 use of the instrument consists in fixing the achromatic of the lenses at the object end of the instrument, a subject which has been treated in the article Microscope, P. 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 thought necessary, two or more such lamps may be so situated that the light, which illuminates the object, 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 of 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 highly magnified image of the object is formed; and several phenomena may be detected by this light as it falls back 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 this, the rays of light being reflected from 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 on the screen.

This image being viewed to be 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 objec-
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 12 feet), being such that the light, on each pencil may converge to a point at it: thus there will be obtained a greatly magnified image of the object, which may be observed by many spectators at one time. It would have the same segment of the 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.

Such an image, which was described 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 concave tube fixed by its base to a frame of wood; the latter being screwed to a closed window-shutter at an aperture purposely made in the latter: the tube pro-
jects into the room, which, when the observations are to be made, is rendered quite dark, and is sometimes lined with black solar microspherically reflected 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 turn-
ing on the hinge, is capable of being fixed at any angle with the wall of the building; while the ring to which it is at-
tached 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, he made to converge light proceeding 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 contain-
ing the mirror last mentioned, but a little above the lat-	ter, 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 instrument is sometimes connected with a clock-work apparatus, by which its position is continually varied correspond-
tly to the apparent change of the sun's place; and thus the reflected light is made constantly to pass through the tube which passes itself through the coronas.

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 micro-
scope, which may produce in the image an almost perfect shape and colour, and thus be seen to be 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 lucernar 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, the image will be distinct and correctly defined.

Microscopes of the same principle have been applied to the study of flowers, feathers, bony, mammary, and other microscopic objects without abdomen. The species are trees, yielding a milky juice, with scattered entire coruscous leaves, and 1-flowered axillary or latorial peduncles.

L. Mammosa, the Common or Mammee Sapota, has oblong lanceolate, oblong cuneate, glabrous leaves, with solitary flowers. This plant grows from fifty to one hundred feet in height. It is a native of the southern 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, under which is a soft, white, subacid, very aromatic, 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 ranked with the genus Asimia, the species of which also yield edible fruits.

(ACHRAS, P. C.)

(Don, Gardener's Dictionary.)

LOUGI, ANDRE'A DJ, commonly called L'Ingegno, and sometimes Andrea di L'Ingegno, 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 Remondino in his 'Italianische Forschungen,' where the table of facts points out how, in the present century, it has been invariably followed by all subsequent writers on the subject, down to the time of Rummoh, that L'Ingegno was the rival of Raphael in the school of Pietro Perugino, that he became suddenly blind while assisting his master Perugino in the Sistine Chapel; and that the then pope, Sixtus IV., granted the unfortunate painter a pension for life, which he enjoyed until his eighty-sixth year. Rummoh has shown this account to be, with one exception, wholly incorrect; the only possible part of it is that L'Ingegno assisted Perugino in the Vatican; this he may have done, as he was his assistant in some works in the Cambio, or Exchange, of Perugia.

L'Ingegno was the fellow-pupil with Perugino, for he painted only one year after the birth of Raph-
ello, in 1484, a coat of arms for the town-bull of Assisi, where he was then an established master. He also, long after the death of his master, held official positions, and can never doubt of his retaining his sight. In 1505 he was procurator; in 1507, arbitrator; in 1510, syndic syndi-
ciator potestatis; and in 1511 he was appointed by Julius II. papal treasurer at Assisi—Canemarius Apostolicus in Civitate Assisi. L'Ingegno, therefore, instead of receiving a pension from Sixtus IV., received a salary from Julius II., 27 years after the death of Sixtus, who died in 1484. From these several appointments he had probably given up painting, which may have been either owing to weakness of sight or from greater advantages to be had elsewhere: his brother was one of the canons of the cathedral of Perugia.

The only certainly known work by L'Ingegno is the coat of arms already mentioned. The prophets and sibyls in the Cambio at Perugia are assigned to him, but it is quite uncertain what portion of these works he has executed by his own hand: the prophets and sibyls also in the Basilica of Assisi were attributed to him, but it has been shown that they were executed in the sixteenth century by Adone Dole. There are further attributed to L'Ingegno two sculptures of the works at Bolsena, and a Holy Family in the Louvre, a beautiful small work in the style of Perugia. Rumohr conjectures, from the style of L'Ingegno in these works attributed to him, that he was the pupil or prentice of Domenico Marmolada. He seems to have been more for a general aptness for business, than for any particular skill in painting.

(Vasari, Vite de' Pittori, &c.; Lami, Storia Pittorica, &c.;
LUNACY. [Insanity, P. C.; Lunacy, P. C.] 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 Do 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 Do Lunatico Inquirendo. The first section empowers the Lord Chancellor to appoint two serjeants or barristers-at-law, to be called 'The Commissioners in Lunacy:' and enacts that in future all Commissions in the nature of Writs Do Lunatico Inquirendo shall be directed to such commissioners, and that such commissioners shall hear and decide all cases in which courts of chancery, admiralty, and probate have execution, and 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 commissioners, and the practice in matters in Lunacy; and to regulate the number of jurors to be sworn to try inquests on persons who are directed to be dealt with under the acts De Lunatico Inquirendo; 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, § 2, the two commissioners of the Lunacy are henceforth called Masters in Lunacy, and 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, §§ 95-99.

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 commissioners is 2000l. a-year, free from all taxes or abatements.

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 Lunacy, P. C. But the term lunatic is also applied to any person who is convicted of being committed in lunatic asylums or hospitals, under such regulations as the 8 & 9 Vict. c. 100, §§ 44-49 prescribe, without having been found lunatic under an inquisition; and also to any single patient who is boarded or lodged for pay at 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 (§ 111). The above regulations govern all so-called lunatics, who have not been found lunatic by a jury, the 8 & 9 Vict. c. 100, § 94. Conclusively, That whenever the commissioners in lunacy shall have taken any charge of the property of any person declared or taken charge of as lunatic, that charge is not duly protected, or that the income thereof is not duly applied for his maintenance, such commissioners shall make such inquiries relative thereto as they shall think proper, and

LUMBRICARIA, a genus of fossil Annulida, from the Silurian strata of Tyrone. (Portlock.)

LUNACY.
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 certifi-
cate under the provisions of that act, and shall either have been discharged or declared insane for the twelve months next past, 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 condition of the person described in the certificate, and such certificate is authorised 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 with an executor of the person: and a lunatic found by such 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 by such 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 shall not further 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 made the inquiry or not, direct a commission to be appointed to inquire into the nature of a writ Do Lunatico Inquirendo to issue, to in-
quire of the lunacy of such person.

In the Roman system, persons of unsound mind (farii) were treated as incapable of making decisions under their own volition. The examination and medical records of every lunatic patient were recorded in the praeiturae. The medical officers were appointed by the secretary to the commission. The commission was to be appointed for the care of the insane. 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 the maintenance and care of pauper lunatics; and to be 
registered by the secretary to the commissioners. This act only extends to England and Wales, and it does not affect Bethlem Hospital, London. The persons appointed to hold commissions under this act shall be husbands of the commissioners, and are in future to be termed Masters in Lunacy.

The second act, which repeals Geo. III. 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 the judges who shall determine how far in their respective counties they shall have licences to establish asylums, where none such already exists; and all proposals, agreements, plans, and rules of regulations of each asylum, are to be submitted to the commissioners, and all contracts and esti-
mates 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 committees to grant retiring allowances to 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 secretary of the hospital, at Edinburgh and London. This act extends only to England and Wales, and does not apply to Bethlem Hospital.

Great advantages may fairly be anticipated from the restric-
tions imposed by these acts; and the alteration of the law considering 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 management of private asylums must vary considerably, as such houses are rarely built for the purpose, and are frequently under the direction of persons unfitted by their want of education 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 sanction of the State, and which have been the subject of their praise; especially in those large private 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 comfort and care of the patients, is such as 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 more to the danger of cruelty, than the unfortunate who live in their own houses, and are not infrequently 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 treatment of the insane. The minister, however, has provided for the care of paupers, and for the inspection of private asylums, as well as public institutions.

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
officers. In some there is a resident physician who holds the supreme authority, and is also steward and general manager; in others the chief officer is the head of the whole establishment; and in others the chief officer is not medical, and the physician is non-resident. The Norfolk asylum was partly founded by a private company, and is so large on paper as to have an English army with a resident medical officer; and it is this fact that has so often been severely commented on by the commissioners in their report.

Under the new act a resident medical officer has been appointed to each asylum, and the whole responsibility of the managers 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 superintend the whole management of the asylum, and that there should be 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 that requires to be settled in some uniform manner; owing to the matron having in many cases the wife of the superintendent, an undue importance has been given to her position; the appointment of the female attendants, and even the classification to the injured patients, has been left in her hands. When we consider that the matron cannot possibly have had a medical education, and that in very few cases those who hold the situation possess any previous knowledge of insane cases, 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, there is no matron; a few of the most experienced female attendants act 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 but be of the greatest disadvantage. At 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 supervision of asylums for the insane into its own hands, we trust that the mode of proceeding will be to appoint to each asylum one or more superintendents, each one of whom will be entrusted with the entire conduct of the asylum; and to whom, therefore, the power of appointing and dismissing all the subordinate officers shall be given. Uniformity of system, the want of which has been found to exist in each and every institution, is the great defect of the present system, and the careful selection of a competent principal officer responsible for every instance of negligence or cruelty in the asylum under his care, could not fail to improve the general management of these institutions. At Glasgow the whole authority has for some years been in the hands of the resident physician, with the most satisfactory results; and an appointment is made in this plan for Irish and Scottish asylums, where the non-resident principal is the principal officer.

By the acts lately passed, the power which the justices who had the control of different asylums possessed of passing rules at any meeting which entirely changed the system of management, or of summarily dismissing any officer, is done away with. The caprices of the governors of some asylums have changed their entire constitution in a few years.

A great improvement has been made of late years in the class of persons appointed as attendants, or, according to the old phraseology, keepers. That all such persons should possess benevolence and intelligence is essential to the effective working of a properly constituted asylum, and they should be liberally paid. The proportion of attendants to patients in the different English public asylums varies from one to ten, to one to twenty; the former does not seem too much, and is far better than that in the well-managed prisons, where it is however small, should have less than two attendants, in order that it should never be left without one; this is enforced by the rules of several asylums. A large number of attendants renders a vigilant superintendence by night practicable, which is no less important than by day, although it is entirely omitted in some institutions.

Whilst many excellent asylums exist for the rich, and the law is providing an increase of accommodation for the poor, benevolent individuals are now making efforts to secure the benefits of mental reform to the middle classes. It has been suggested to build an asylum in the neighbourhood of London for 300 patients, at a cost of 30,000l., which sum is to be raised by donations and subscriptions. We believe that it will be self-supporting, and it is expected that payments of from 12l. to 1l. 10s. per week for each patient will cover all the expenses. No existing asylum offers to persons able only to pay such a sum the comforts and grace that 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 instances. Others have been originally on the outskirts of towns, and have been surrounded and built in by the increase of building. The commissioners mention several so placed in proper terms of censure.

It is generally admitted that the building ought not to be smaller than 300 feet square; and the additional asylum for Middlesex is projected to hold 1200. As to plan, no two of the existing asylums are alike, and the most recently erected are by no means the best. In the Surrey asylum a complete circular plan has been most admirably adopted, so that the newest part of Hanwell, in which the bed-rooms face one another, and the galleries are lighted from the top, which renders proper ventilation impossible. To make wide galleries with rooms only on one side would certainly increase the cost of the building; but by introducing a bow or expansion into each gallery, the necessity for a day-room will be done away with. An open area should be left in each of such expansions; it will be a great source of comfort to the patients, and an improvement in the ventilation as well as the general appearance of the gallery; and, with a light wire guard, is perfectly safe. This plan is to be adopted at Hanwell. The chapels should be upwards of 200 feet by 50, and as a ward must occasionally be left with one attendant, there is an advantage in bringing the whole of it within sight from a central position. No ward should contain more than thirty patients; and of those from twenty to twenty-five ought to have single rooms. It is matter of regret to find that dormitories are approved by the commissioners, and supported by the officers of some asylums; they certainly lessen the cost of building, but the quiet and comfort of the institution must be much diminished. Their ventilation is also very difficult; single rooms may be warmed with a hot-water pipe passing along the floor (not over-head), and opening the window for the sake of ventilation will be sufficient for this purpose; but in dormitories it will be difficult to preserve freshness of air with warmth, more especially as the great argument in favour of them is their economy, and an economy partly made by not being responsible for patients' comfort, and partly by having them all in a cubic foot that would be given in a single room. For the sick, the violent, the dirty, and the noisy, single rooms are obviously necessary; and it will, we believe, generally be found that the remaining patients, those whose tranquillity and usefulness entitle them to indulgences, will consider a single room, which they can call their own, one of the greatest that can be given them.

An asylum containing 400 patients may probably be built in a straight line, which is desirable, without the necessity of carrying it higher than the first floor. The chapel and chief officers' rooms, and the rooms used for the worst management of the patients, should form the centre; behind which the kitchen may be conveniently placed, with the laundry on the side next the wards of the women, and the workhouse on that of the men. In the wards branching off from the centre those patients who are quiet and convalescent and the sick should be placed, and the most refractory at the extreme ends of the building, to prevent them from disturbing the others.

Six classes of patients should be made: one, composed of those of which some modification of management will be required:—

1. Tranquil: convalescent and melancholic.
2. Moderately tranquil.
3. Refractory.
4. Sick and intrin.
5. Idiots and other dirty patients.
6. Epileptics of the better class.

These are frequently in
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 noisy rooms form 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 great 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, whether in work or structure, 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.

The commissioners have expressed an opinion that incurable paupers may be accommodated in asylums apart from the curable at a much less expense, and an arrangement for a separate provision for incurables is required by the new act (s. 27) but it cannot be aware that while the incurables comprise all the most tranquil and intelligent of the patients, whose society is of great value to the curables, they also comprehend patients who display every different form of insanity, and require every variety of treatment. It is certainly much to be wished that provision could be immediately made for all insane paupers; but we cannot consider that the removal of all hojje from a large number of them, by immuring them in an 'asylum for incurables,' would be the best mode of attaining this object.

The following is a statement of the cost of building and furnishing twenty-two asylums, including that of the land, which in some cases amounts to a large sum. The mean cost for each patient accommodated is 1542. £2., which is probably more than will be found necessary in most future asylums.

The expense of maintaining patients varies from seven to fourteen shillings per week; this must of course depend in some degree upon the prices of provisions in different parts of the kingdom, and be modified by cheap and dear seasons.

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<th>Name of Asylum</th>
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<th>Cost</th>
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<td>16,964</td>
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Statistics.—There are in England and Wales 12 county asylums, 4 licensed, and 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 here added 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 resort 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 containing 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 cases where 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 to which we can obtain information, 28,537 males, 38,328 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 1945; 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, 1862 were males and 11,031 females; thus the females exceed the males in the proportion of 1 to 984. The greatest 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 cures are taken as 1.

The term 'Removed' includes all discharged improved or uncured, or escaped.
their comparative immunity from epilepsy and paralysis, which, when combined with insanity, render recovery very nearly if not quite hopeless. It is said also that women more frequently recover from the acute stage of mania, where men die of exhaustion.

The reverse of this apparent rule is found only in the results of some of the smaller asylums, where the deaths of either sex are few. In those returns where the sexes are not distinguished we have reckoned the proportion as equal.

The tables of per-centages of cures and deaths published by the Commissioners have unfortunately not been compiled upon any fixed plan. All computations, excepting upon the average number of patients in the asylum during the specified year, must be fallacious. The following Tables (III., IV.) have been made upon that principle; the blanks indicate the cases in which correct returns are wanting. Some asylums do not publish their average number of patients; others calculate the per-centages of cures and deaths upon the whole number admitted; but this is an entirely delusive method, as these numbers must be continually increasing, while the proportion of patients remaining decreases.

We have, as far as possible, made an average of all the public asylums in Great Britain. The mean number of cures thus appears to be 21:26 per cent., and of deaths 9:92 per cent.; but many asylums depart very widely from this standard. Bethlem, St. Luke's, and their comparative immunity from epilepsy and paralysis, which, when combined with insanity, render recovery very nearly if not quite hopeless. It is said also that women more frequently recover from the acute stage of mania, where men die of exhaustion.

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2. Duration of disease.
3. Duration of residence.
4. Age of first admission.
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.

**Additions of Personal Exercises.**—No part of the treatment of 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-restraining 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 "human 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 progressive amelioration in the management of asylums.

Until the establishment of Bethlem in 1547, 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, suspected 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 most at Jerusalem in the sixth 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 site and protection 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 who might appear as more 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 Pindol was the first to attempt the restoration of the insane to a position among human beings. The scene of his exertions, which were the first serious attempt at the restraint of madness in the Bethlem hospital for insane men, near Paris. In this frightful prison the universal practice was to load patients with heavy chains,
which remained on for the remainder of their lives, and to
ensure them in dark, unwarmed, and unventilated cells. 
Pinel determined on a once releasing a large number of
patients. The following account of the experiment is
extracted from the 'British and Foreign Medical Review':—
"Towards the end of 1792, Pinel, after having many times
argued the government to allow him to unchain the manacles of
the Bicêtre, but in vain, went himself to the authorities, and
with much earnestness and warmth advocated the removal of
this monstrous abuse. Couthon, a member of the commune,
gave way to M. Pinel's arguments, and agreed to meet him
at the Bicêtre.
Couthon then interrogated those who were
chained, but the abuse he received, and the confused sounds
of cries, vociferations, and clanking of chains in the filthy
and damp cells, made him recoil from Pinel's proposition.
"You may do what you will with them," said he, "but I fear
you will become their victim." Pinel instantly commenced
his undertaking. There were about fifty whom he considered
might without danger to the others be unchained, and he be-
gan by releasing twelve, with the sole precaution of having
previously prepared the same number of strong waistcoats
with long sleeves, which could be tied behind the back if
necessary. The first man on whom the experiment was to be
tried was an English captain, whose history no one knew, as
he had been in chains forty years. He was thought to be
one of the most furious of them; his keepers approached
him with caution, as he had in a fit of fury killed one of
them on the spot with a blow from his manacles. He was chained
more rigorously than any of the others. Pinel entered his
cell unattended, and calmly said to him, "Captain, I will
order your chains to be taken off, and give you liberty to
walk in the court, if you will promise me to behave well and
injure no one." "Yes, I promise you," said the maniac: "but
you are laughing at me; you are all too much afraid of me."
"I have six men," answered Pinel, "ready to enforce my
commands, if necessary. Believe me then on my word, I
will give you your liberty if you will put on this waistcoat."
He submitted to this willingly, without a word: his chains
were removed, and the keepers retired, leaving the door
of the cell open. He raised himself many times from
the seat, but fell again on it, for he had been in a sitting
posture so long that he had lost the use of his legs; in
a quarter of an hour he succeeded in maintaining his balance,
and with tottering steps came to the door of his dark cell.
His first look was at the sky, and he cried out enthusiastically,
"How beautiful!" During the rest of the day he was con-
stantly in motion, walking up and down the staircases, and
uttering exclamations of delight. In the evening he returned
of his own accord into his cell, where a better bed than
he had been accustomed to had been prepared for him, and
he slept tranquilly. During the two succeeding years which
he spent in the Bicêtre, he had no return of his previous
paroxysms, but even rendered himself useful by exercising a
kind of authority over the insane patients, whom he ruled in
his own fashion.
"The next unfortunate being whom Pinel visited was a
soldier of the French Guards, whose only fault was drunken-
ness: when once he lost self-command by drink he became

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**TABLE IV.**

Per centage of Deaths upon the average Number of Patients in the Public Asylums for the Insane in the United Kingdom, for ten Years, ending 1846.
quarrelsome and violent, and the more dangerous from his great bodily strength. From his frequent excursions, he had been discharched from the corps, and he had speedily dissipated his scanty means. Disgrace and misery so depressed him that he became insane: in his proverbs he believed himself a general, and fought those who opposed him, regarding both 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, footed his hands and feet being his only aid to close him, regardless of his rank. Once when he broke loose, he defied all his keepers to enter his cell until they had each passed under his legs. He was led into eight men to obey this strange command. Pinel, in his present character, never used his strength, and he was a man of original good-nature, but under excitement incessantly kept up by cruel treatment; and he had promised speedily to that 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 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 taken in charge of the obliging and humane Pinel, knowing with his eye every motion of Pinel, 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 long imprisonment, he did much to comfort them, as a master to his inferiors. He never heard without emotion (says Pinel's son) the name of this man, who some years after this occurrence shared with me the games of my childhood, and to whom I shall feel always attached.

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 inoffensive, becoming animated only on being conversing with other 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 altogether, who had been intentionally done, were in fact 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 prict, 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, appalling all familiarity; his hair was long, and hung on each side of his face, which was pale, intelligent, and resigned. On his being taken in charge of Pinel, his chains, which were the only symbol of his suffering, were removed. "I am a martyr," he solemnly replied, "Fratres sunt Dominum tum." His whole life was a romance of religious excitement. He undertook on foot pilgrimages to Cologne and Ratisbon, and attempted to convert 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. Pinel 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 produced on the patient a most deplorable effect. The heavy 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 prepossession, and was dismissed from the Bicêtre.

In the course of a few days, Pinel released fifty-three men from chains, and his procedure was imitated by all conditions and countries: workmen, merchants, soldiers, lawyers, &c. The result was beyond his hopes. Tranquillity and harmony succeeded to tumult and disorder, and the whole district was marked by the most favourable effect on the insane themselves; rendering even the most furious more tractable.
severed, notwithstanding all the obloquy heaped upon him, until a complete change of the officials and of the system was brought about.

The next asylum of which we shall have occasion to notice the history is Bethlem, concerning which we find many particulars in the evidence given before the parliamentary committee in 1816.

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 resisting the abolition of restraint, in preserving, under pretense of its being for the benefit of the patients, the more odious, 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 1810 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 his own benighted confidant, has since been an incident, and 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, with his cudgel, from any restraint or punishment, 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 at an upper door or window. On an upright massive iron bar, more than six feet high, inserted into the wall. Round his body a strong iron bar, about two inches wide, was riveted; on each side the bar was a circular projection, being fashioned to and fastening each of his arms, pinioned 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 before and behind. The iron ring passed through the neck was connected with 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 engaged and confined no less than twenty 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 the insane may be observed. Chains were removed, and all the restraints of the older kind subverted; and more care was given to the warming and clothing of the patients. Some of the largest asylums in England were opened between 1816 and 1825. The introduction of employment among the patients, as at Hanwell, was a great advance in the amount of confidence reposed in patients; employment has since been introduced in almost every asylum, and no serious accident, so far as we are aware, has ever occurred from allowing the use of tools. The credit of declaring the total abolition of mechanical instruments of restraint to be desirable and practicable, belongs to Dr. Charlesworth and Mr. Hill, of the Lincoln lunatic asylum. The progress of the agitation was given by Mr. Hill in a lecture delivered by him at the Lincoln Mechanics' Institution, 21st June, 1838, and since published with the addition of extracts from the 'Proceedings' of the asylum, and tables showing the gradual decline of restraint. A reference to a few of these will illustrate this part of the history of the non-restraint system. The Lincoln asylum was opened on the 20th April, 1830, and was conducted from the first on humane principles, but with all the usual instruments of restraint.

On the 29th February, 1829, it is reported that a patient has died in the night in consequence of being strapped to the bed; and an order was accordingly given that the use of the strait-waistcoat shall be discontinued, except under the special written order of the physician; and also that every case of restraint shall be entered in a journal, with its nature and duration.

On the 4th May, in the same year, the "heaviest pair of iron bonds," which were jointed, and weighed 3lbs. 8oz., and the "heaviest pair of iron hand-cuffs," which weighed 1lb. 6oz., are ordered to be destroyed; five strait-waistcoats are likewise condemned.

Numerous entries in 1829, 1830, 1831, and 1832 prove the difficulty with which the change took effect. On the 14th July, 1829, is the first order for strong dresses for such patients as tear their clothes. These patients were in all asylums the most subject to continual restraint.

21st May, 1830. All the instruments which would confine the fingers were ordered to be destroyed; but manacles for the wrists and leg-locks were retained. March, 1837, the system of restraint was entirely abolished.

Mr. Hill's lecture, which contains much that is exceedingly interesting upon this subject, has the following sentence, which has been the text on which all the controversy on the abolition of restraint has been founded:—"In a properly constructed building, attended with a sufficient number of attendants, restraint is never necessary, never justifiable, and always injurious, in all cases of lunacy whatever." This sentence, when published in 1838, was declared even by those most inclined to the new system to be too occlusive, and likely to produce a bad effect; but fortunately the lapse of eight years has proved its perfect truth, by its adoption as a principle in all the most important asylums in the kingdom. But the upholders of the old system received the announcement of a doctrine so startling as if there were something atrocious in proposing to liberate those who were unfortunate enough to be insane; and for years after restraint had been actually abolished, the non-restraint system was declared "utopian" and impracticable; then declared to be practicable, but not desirable; and at length, when every other argument has failed, those who have so strenuously opposed it come forward and claim it as their own system, which they have been practising for years, excepting that it is carried a little further.

Too much stress was laid by Mr. Hill on the necessity for tall and powerful attendants; and the management of Lincoln was said to depend much on the rings of the non-restraint system, 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 utterly discarded at Lincoln. Mr. Hill, when he visited Hanwell, was unknown in the other asylums where restraint is abolished.

The experience of the Lincoln Asylum has proved every advantage arising from the non-restraint system, notwithstanding that, among the numerous asylum attendants, many of them, from some of the medical officers, by whom every kind of unfair evidence was brought forward against the system, and the cruelties practised by unfit attendants 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 superintendent of the asylum (Hanwell Asylum, 2nd June, 1850) it contained eight hundred patients; of these about forty were, almost constantly in restraint-chairs, and a number of others were strait-waistcoats, muffs, leg-locks, &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 from turning off their faces in a fit, and so becoming smothered, which, it is asserted, has sometimes happened. No such case has however occurred since the disuse of the hand-straps, which took place in July, 1839.

We extract from Dr. Conolly's first report (October, 1839) the following account of the discontinuance of restraint at Hanwell:—

1. Article of treatment in which the resident physician
has thought it expedient to depart the most widely from the previous practice of attending and visiting patients 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 advantage resulting from the most uniformly strict and customary in its time of his appointment was in no respect proportionable to the frequency of its application; that the objections to the restraint actually employed were very serious; and that it was the subject of out- rages and disorders, to repress which its application was com-
monly deemed indispensable, and consequently directly op-
posed to the chief design of all treatment, the cure of the disease. 

By a list of restrictions appended to this report, it will be
seen that the daily number in restraint was in July so re-
duced 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 Sep-
tember not one on either side. 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.

Dr. Conolly (1843) reports the satisfactory results of the new system. In the 53rd (April, 1840) they report that 'there has not been a single occurrence to weaken their confidence in the practicable nature
of the system, and the result of it is that the whole structure
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 tranquillity 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, and express their entire approbation of the system of
Dr. Conolly. During the past year a suicide (by hanging)
threw the private ward of Hanwell. The patient was
selected from among all the patients in the ward; the report
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The last report of the
Lincoln Asylum states that not only have suicides ceased since the adoption of non-restraint was introduced, but that the tendency
to suicide has disappeared. The latest report of Benth-
lon also contains an admission that restraints increase the tendency to suicide.

The second division of 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 epileptic patients is noticed. Seclusion, however, is not im-
portant for restraint as is usually supposed.

This very useful remedial agent is styled by 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 reas-
sons in the practice of the days of restraint is certain; for then it was a common practice to strap a patient in bed or in a restraint-
chair placed in his bed-room. Any abuse of seclusion 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 abuse. All the substitutes have their defects; none more so than that which is of all the most useful, the most simple, and the most approved of by the highest medical
authorities, namely, Seclusion. By seclusion is meant, tem-
porary protection of the mind. It has no other object than
acting upon the senses in the refractory wards of a lunatic
asylum.'

In the sixth report (October, 1844) likewise, Dr. Conolly
writes: 'the whole of the asylum has been in great part devoted
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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 prevent admission of light or air for
suicide. In the treatment of the insane nothing is trifling;
for upon careful attention to the most minute matters must
depend the perfection of the management of any asylum.

The report for the year 1844 contains many statements in
favour of the benefit of non-restraint. Dr. Conolly also states
the result of two years' experience, under sixteen heads, which
depend that difficulties must be expected in abolishing re-
straint, from the indulgence of attendants accustomed to rely
on it, and from the violence at first committed by patients
long deprived of freedom of action; but that if steadily per-
severed in it will be found to produce greater tranquillity,

fewer outrages and accidents, more general cheerfulness,
and less obstinacy and malice; that good effects will be especially
observable in patients newly admitted and treated entirely
without restraint; but that complete uniformity of feeling
among the officers, and a sufficient number of humane and
vigilant attendants, are indispensable to carry the system to
full perfection.

In this year (1844) a man aged 82 died, a consequence of
a kick given by another patient. The injury would probably
be so far, the weakness and great age of the patient produced a
fatal result. The patient who inflicted the injury was subject
to epileptic paroxysms; but was so quiet in the intervals as to
be a help in the wards, and he was actually so engaged at
the time of the unfortunate occurrence; this very patient has
become tranquil and manageable; and the ward in which the
fatal occurrence took place has become, since the abolition of
restraints, one of the most peaceful. This Hanwell Ward has
the great advantage of which the doors are always open, the windows full of
flowers, and the air clear.

Dr. Conolly's fourth and fifth Reports (1843 and 1845) contain his confirmed opinion that, 'by the abolition of
restraint, the general management of the insane has been freed from
many difficulties, and their recovery in various degrees greatly
promoted.' The sixth Report (1846) is in a great measure devoted to pointing out the erroneous notions which

Here we may consider the subject of non-restraint con-
duced so far as its practicability is concerned. If no case
requiring restraint has occurred in an asylum containing nearly
a thousand patients during six years, in which time eighteen
cases have been treated, it is unlikely that any more
difficult cases can occur elsewhere. It is nowhere insisted
that restraint can never be necessary in ill-constructed asylums,
and until houses for private patients are constructed for the
purpose for which they are used, some restraint will probably
be used in many of them. The system introduced at Lincoln,
and followed at Hanwell, was very shortly afterwards adopted
also at Northampton, Gloucester, and at the General Asylum
in Glasgow. The new asylum at Glasgow bears on its founda-
tion-stone, laid on the 1st June, 1842, an inscription stating
that one of the principles to be adopted in it is that of 'employing
mechanical rather than mechanical restraint in the treatment of
patients, which had already been abandoned for a considerable
time.' The non-restraint system was also introduced at
Hillsd Hospital, Portsmouth, in 1842, and we gather from the
Irish Reports that some asylums in that country have adopted
dordony, and Maryborough, and that very little restraint is
used at Clonmel and Waterford; and there appears every
reason to hope that it will be one of the standing rules in the
Irish District as it is in the English.
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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; this asylum was one which was connected with the non-restraint system, but when the change was made, the mental condition of the patients improved to such an extent that the method was considered successful. At Glasgow, the asylum was taken over by the city corporation and organized along the lines of the non-restraint system, when first introduced. The reports of Nottingham, Dorset, Morriston, Edinburgh, and Dumfries speak of the advantages of restraint, although the writers abstain from avail-
ing themselves of the official returns. On the contrary, St. Luke’s, Kent, Oxford, and the Retreat at York, profess the non-restraint system, while they practise the restraint.

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 op-
posed to the new system, from various motives. First we must mention the unkin 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 houses under their 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 cruelly adduced in the hands, and are most ably answered in a pamphlet by Mr. Sejnant Adams. Many of the cases brought forward by them as proving the necessity for re-
straints, are in fact strong arguments on the other side of the question. With which of the Commissioners have they been selected, until lately, exclusively from persons ignorant of insanity, must be the excuse. The absurdities which they have allowed themselves to believe and to record, would almost cause them to have been wilfully 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 asylums 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, 1846) deserves to be quoted.

After saying that the same system with reference to re-
straint 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 ef-
fects, physical restraint in some form or other—but still re-
straint—cannot be dispensed with. Truly the so-called "total abolition" of restraint appears to be only one of the many sham and specious modes introduced to perpetuate 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 without it; but this is in no way parallel to the system the latter is in so utterly inconsistent 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 doubt upon the very curious cases subjoined, where patients request the strait-waistcoat and the muffins as favours, and pro-
mise 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 re-
straint, is so monstrous as scarcely to deserve notice. As

readily would we believe that negro slaves are in the habit of requesting the scaffolding of a flogging, or beg-glers to allow them the agreeable exercise of the treadmill.

With the results before us of the treatment of many thou-
sand patients without restraint, and taking into consideration the experience of the system where the hands of the physi-
curables is greatly increased, we consider ourselves justified in considering that the strait-waistcoat, the coercion-chair, and the other hideous instruments of restraint, will shortly disappear like the, "chains and a straw, the starvation, the whirling-chair, and every other mean 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 Regulation of the Care and Treatment of Lunatics" (S. & G. 9 & 10 Vict. c. 120); "A Bill for the Provision and Regulation of Lunatic Asylums for Counties and Boroughs, and for the maintenance and care of Pauper Lunatics, in England" (S. & G. 9 & 10 Vict. c. 120); "Report of the Inspector General of the Lunatic Asylums in Ireland," 1846; "Returns from each District Lunatic Asylum in Ireland," 1845; "Reports of all the principal Asylums in England, Scotland, and Ireland, and infor-
mation respecting the sundered by many the facts of the House of Commons, 1846; For the "History of the York Hospital for the Insane," "The Description of the Retreat near York," "On the Description of Lunatic Asylums," Brown’s "Lectures delivered before the Managers of the Montrose Lunatic Asylum," Remarks by Mr. Sejnant Adams on the Report of the Metropolitan Commissioners in Lunacy; Personal knowledge of the Mid-
dees Lunatic Asylum, Hanwell.

The custody of the insane in Scotland is, like every other matter of importance, demanded both magisterial and executive inter-
vention, connected with the system of local courts. The law on the subject is contained in three statutes: 55 Geo. III. c. 69; 9 Geo. IV. c. 34; and 4 & 5 Vict. c. 60. By these laws two classes of institutions are mentioned: one an asylum, or private asylum, without a warrant from the sheriff. Any person accessory to a breach of this regulation is liable to a penalty of 500; and if he be the keeper of the asylum he is liable, too, to a fine of two hundred guineas, and to imprisonment not exceeding three months’ duration. The sheriff is also empowered to grant a warrant unless on the report of a qualified physician or surgeon; and the person granting such a certifi-
cate is liable to a penalty of 600, if he has omitted carefully to examine the patient. The keeper of every house where two or more insane patients are kept requires a licence for an asylum. Any person acting as keeper to an insane individual, or his instrument, must make an annual report to the sheriff, certified by two medical men of the state of the pa-
tient, and must notify the death or removal of the patient. In every licensed asylum a "ward-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 seals the book, and retransmits it. When a patient dies in a licensed asylum, a report must be made to the sheriff within twenty-four hours, accompanied 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 reasons for the tardiness, if any. The sheriff shall not open to the inspection of the sheriff. In the general case, the sheriff or his substitute may perform the duties of the office regarding lunatics; but it is especially provided that all questions relating to the treatment of lunatics shall 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 ad-
ministrative 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 en-
forcement of its provisions. We venture the statement to the treatment of the insane, and the consequent toleration for breaches of the sta-

tutory regulations. The general rule adopted in practice was, that insane persons were allowed to go at large until they chose to return. The houses of the county, and their neigh-

bours, 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 necessity of the employment of the county justicemen is under-
tific advice, is felt by all who are connected with them, or concerned in the administration of the law. The Com-
mis

sions who in 1844 reported on the state of the poor in Lunatic Asylums, declared that "in many instances the system of the County is so grossly defective," that they are of opinion that the system of the County is so grossly defective," that they are of opinion that the
LUTZELBURGER, or LEUTZELBURGER, Hans, called also Hans Franz, 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 designs of the celebrated woodcut series of 'The Dance of Death,' attributed to 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 some writers and combated by others, and especially by Rumohr in 1856, in a work entitled 'Hans Holbein der Jüngere in seinem Verhältniss zum Deutschen Formschmiedwesen' (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 Leutzelburger, and which are described at length in the Kunstblatt, and in the works of Ketsch, Heller, 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.

LYZULA, 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. symphyta, the corn-lichen, is a native of Great Britain. L. campestris is common in the pastures of this country, and seven species are natives of the British Islands.

LYCHINIS (from λύχη, a lamp), a genus of plants belonging to the natural order 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 downy herbs, with terminal corollas of flowers, rarely solitary.

L. Chalcodromica, the Scarlet Lychnis, is a smooth lanceolate plant, with rose-coloured flowers in bunches; the calyx cylindrical, 5-cleft; the calyx 2-lobed, the corolla long; the leaves lanceolate, slightly coriaceous at the base, and clasping the stem. This plant, which produces scarlet, rose-coloured, or white flowers, is a great favourite in our gardens, it is a native of Siberia and Japan. Several varieties of this plant have been named.

L. grandiflora is a glabrous plant, the flowers solitary or terminal, terminal and axillary; the calyx tuberous, clavate, ribbed; the petals inserted; corolla elongated; the leaves ovate, almost sessile. It has large beautiful scarlet flowers, and is a native of China and Japan.

L. Flos Cuculi, Ragged Robin, has 5-7-cleft leaves, with a very short stalk; it is rose-coloured, petal-sheathed, and is an abundant plant in the moist meadows and pastures of Great Britain, as well as the whole of Europe.

L. repertina, White Campion, has the petals half-bifid, and of a soft, pinkish, velvety red, with the calyx reflexed. The flowers are often cultivated, and the plant has a sweet smell. It is a native of Europe, and is cultivated in gardens.

L. diurna, Red Campion, has the petals half-bifid, the calyx teeth of the fertile flower triangular, the capsule nearly globular, the teeth reflexed.

The other British species of the genus Lychnis are: L. Githago, the Corn-cockle, a pretty plant blossoming in cornfields from June to September; L. alpina, found on the mountains of Forfarshire; and L. Vitacea, 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 or seeds.

(From Gardener's Dictionary; Babington, Manual of British Botany.)

LYCIA. In addition to the general description of the country in the P. C., and the geographical details in the article Anatomia in the Scoto-Hibernian, on page 1112, we give a few particulars respecting the inhabitants and natural productions of this most interesting portion of Asia Minor.

The country is, as it seems, well inhabited, chiefly by Turks, many of whom lead a life half settled and half nomade; they are distinguished above all other inhabitants of Asia Minor by their excellent character. Most of them are farmers, and some are traders, particularly the Armenians and Greeks who live in the sea towns, and 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 the traveller, but on nearer acquaintance they appear to be a sort of dying race. The Turkish peasant 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 and suspicious, through being treated as they are by Turkish officers and the Sultan's officers, who take away every thing they please without paying for it. Among the coast of Lycia as well as the adjoining provinces of Asia Minor, there lives a breed of cats known as the "Lyly,"* which term is here applied to the leopard, and is an Arabic word meaning the "Euphuism." There are also the "Sanho" and "Iror," or the "Peris" (perhaps the panther), commit great depredations among the herds; great numbers of them are annually killed, and a reward of from 100 to 200 piastras is given by the government for each "sanho." They are very frequent in the district of Sidymes 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 dog, though much stouter; they possess large numbers of these oxen 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 which such spirited representations are seen in the ancient sculpture. The breed of Armenian horses is of a large size, the feet are remarkably fine and thin, and the ears are small, as in the antique. They are not shod. The rivers and lakes abound with large tortoises, and on their banks the trees swarmed with the green climbing frog. No part of Asia Minor contains such splendid valleys as those of the Xanthus and the Dolymon Chai. Myrtle, oleander, and pomegranates cover the banks of the rivers; the plain along the rivers are 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 green storks, which are most beautifully metled together by vine, clematis, and very other climbers. Fruit trees are planted in enclosures. The hills are covered with large oaks and planes, which supply excellent timber, of which, however, only small quantities are shipped from the coast towns. The oak, 'quercus sepilina,' is a source of wealth from its abundant "velaines" 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 named "Pakiri," does not exist for table use. In proportion as the traveller approaches the high upland plains, the tender fruit-trees, as well as the olive, the aloe, and the palms, and plants disappear, and are replaced by walnut, apple, and other trees. The hills around Almali, which is 4000 feet above the sea, is one of the largest and best cultivated corn tracts in Asia Minor; its chief produce is wheat, of which some half-fabulous food for horses. Mainis is chiefly raised in the valleys and on the hills.

LYCOPERSICON.

SYRIA.


The first mentioned works of Lycy gave the name of Euphuism to a fashionable style of language, of which, although he certainly did not invent it, he contributed much to perfection. The Euphuism of Lycy himself was just an exaggerated form of that straining, pedestrian, over-elaborated style which has been discredited by the age 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 digressions, and in the language of mathematics, history, and natural history. Drayton, in ascribing to Sir Philip Sidney (himself a simple writer) the merit of having brought back the tone of language to nature, speaks of Lyly as

Shakespeare'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 highest personages in the same play. The absurdisties of it are belittled by Jonson in his 'Cynthia's Revels.' Sir Fretier Shafton, in 'The Monastery,' is an unsuccessful attempt at representing the characteristics of Euphuism. Lyly's Book of the Duke of Lenox is the only comedy 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 interpolated through them. The wit of them is one of the most original that exists. In porportions of character these plays can make no claim; and as little can their mythological, pastoral, or classical story, be said to possess dramatic interest, or to be treated with dramatic force. The author's style is very much like a dramatist's ruse almost wholly on his position as one of Shaker's immediate predecessors; and on that the facts plays present, in strong relief, some of the distinctive characteristics of the literary influence which prevailed in the interesting age.

LYON KING AT ARMS. [HERALD, P. C.]
LYSIMACHIA, a genus of plants belonging to the natural order Primulaceae. It has a 5-parted calyx, a rotate corolla with 5 (rarely 4) petals, and a 5-lobed ovary. The stamens are inserted at the base of the corolla, and are 5 in number. The capsules open with 5 valves.

*L. thyrsiflora* is distinguished by its axillary stalked dense racemes of the flowers; the leaves are opposite and lanceolate. The corolla is divided almost to the base into 5 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 surfaces, and oblong for half their length. This species is the *L. punctata* of some botanists, and probably the *L. punctata* of Dickens, *ibid. iv. cap. 3.*

*L. nummularia*, Moneywort, has a prostrate creeping stem, solitary axillary flowers, ovate acute sepals, and glabrous filaments connected at the base. The leaves are opposite, roundish, and shortly stalked. The peduncles shorter than the leaves. It is found in damp places in Great Britain.

*L. nemorum* has linear lanceolate sepals, smooth distinct filaments, and opposite oval acute leaves. It is found in woods and damp shady places in Great Britain. *L. astroterpaeus* (elater) is a native of Europe and of Europe. It is the only species of Lycopus which has smooth stems.

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M. CRIE, 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 accumulate a property, and spend his time in quiet and spiritual dependence. 'Dr. Crie'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 Mr. M'Crie, at a period when the strictness of that communion was retained in a measure which is now wholly unknown. In these circumstances he received a thoroughly religious education, of the importance of which he was ever afterwards so strenuous 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 1785. 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 repulsion 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 characters. The body to which he belonged followed a rule of Presbyterian discipline, from the strictness of which they maintained that the established church had diverged; and, recurring perpetually to the conduct of the fathers of Presbyterianism, it was like any member of this body with sufficient talent would be the most zealous biographer of those 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 humbler 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 the increase of the body to which he belonged, his work increased in value. His knowledge of Scotland, 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 I. of Scotland. Indefatigably he pursued the researches connected with this volume, and it is scarcely matched in the English language, and it had the effect of revivifying 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 commemoration. The partizan zeal with which those works were undertaken is not their least remarkable feature, and obtained from Mr. Hallam the apt designation of 'Presbyterian Hill-debrandam.' There is no doubt of the accuracy with which Dr. Crie stated facts and cited authorities, and that he was thoroughly honest; but from the beginning to the end each piece is a work of industrious and acute special pleading, and the reader whose position enables him to take an impartial view of the characters dealt with, is likely to pronounce what portions may be favourably dwelt on, and what should be hastily passed over, if not omitted. His pallinations and vindications are singularly ingenious; and amid all the rude morality and the savage acts of the turbulent age of which he writes, he preserves the history of his sect without passion and in accordance with the spirit of history which digresses 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 such a spirit, and being works of genuine learning and research, 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 unerring disposition. He died on the 8th August, 1836, deeply lamented by the members of his congregation and a wide circle of private friends.

(Life of Thomas M'Crie, D.D., by his son, the Rev. Thomas M'Crie, 1840.)

MAC CULLOCH, Dr. JOHN, was born in Gurnessay, 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 Myretown, 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 Gurnessay. 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 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 period, in attempts to make gunpowder, and, after he had effected that, in manufacturing fireworks. 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, from the grammar-school at Lostwithiel, where he remained three years, and where his talents seem to have been appreciated by the master, Mr. McGilvray, 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 5th of April, 1803, accepted the situation of chemist to the Board of Ordnance. In 1807 he read 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 Bretegan, was arrested at the beginning of the French revolution, and one of his most valuable assets, a large house in Edinburgh in 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, with his father's consent, he engaged in the drug business. As a young man, he 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 Schehallian 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 observations, and it is stated that he knew the geological map, as well as for his own amusement and instruction as with the hope that they would be useful to the country. In 1826 he was desired by government to complete the work which he had begun, and this was commenced for the government public work in which he was employed - the mineralogical and geological survey of Scotland, which was continued every summer from 1826 to 1832, when he completed it. The winters of these years were spent in the tedious task of 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, is in itself a most remarkable instance of human industry and skill; and it is now, perhaps, as little known as 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 it was done in the Highlands of Scotland, or in 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 ability with which he performed his important duty, we must make 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,' 2 vols. 8vo., with 1 vol. 4to. of plates, London and Edinburgh, 1816. Next, 'A Geological Classification of Rocks, with Descriptive Synopsis, comprising the Elements of Practical Geology,' London, 1821, 1 vol. 8vo. Thirdly, 'The Highlands and Western Isles of Scotland, in a series of Letters to Sir Walter Scott,' London, 1834, 4 vols. 8vo. This work, in addition to a most graphic description of the country, which some learned dissertations on the history, antiquities, language, music, and economy of the Highlands. Fourthly, A System of Geology, with a Theory of the Earth, and an Explanation of the Glacial Hypothesis; 2 vols. Edinburgh, 1831, 2 vols. 8vo. In 1821 he published a Treatise on the Art of making Wines, which reached a fourth edition in 1828, and in 1830 he published anonymously an account of Blair and Dunkeld, forming a guide-book for the antiquities. He contributed many papers both to the Encyclopædia 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 Medusa found about Shetland and Orkney; so attentive was he to everything that surrounded him. He published many articles in the 'Transactions' of the Geological 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 Nereis Fever,' 2 vols. 1828. In 1830 he published a paper in which he first 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. This was the more remarkable inasmuch as 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 a good musician, and his musical compositions show that he was very familiar with the general structure of the science. His accomplishments, as they are called, were cultivated at times which many persons pass without employment. His drawings were done while others were employed in such duties as those described, and his scientific specimens dried, and painted before breakfast in the long summer mornings. When he used to practise music, he did so during the twilight hours. In short, no portion of his time was unoccupied, and the multifariousness of his labours was still more remarkable from the fact, that for many years he was afflicted most severely by the effects of malaria.

He was also the author of 'Pictorial Tracts,' the 'Pictorial 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 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 1820 he was appointed physician in ordinary to Prince Leopold of Saxo-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, 1835. 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 Gulliv, 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 sensibilities, which for many years seemed rather to have increased than diminished. His manners were courtly; his conversation was rich, varied, apparently exhaustless, though never urged so far as to exclude others, and his geniality was such that he was always as willing to impart information as he was eager to acquire it.

(Principally from the Annual Biography 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 'Calamities of Authors.' He was born about 1745, 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 Dumfries. In 1780, he published 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 on the stage by Colman with much pomp and very considerable success. A stranger of a congregation, he was converted, and in 1791 was commanded to leave his house. He was called to London, leaving his wife and child in beggary. A volume of his sermons was published in 1790; and a volume of poems, including 'Vimonda' and three other plays, appeared in 1791. His dramatic genius cannot be rated high; but he possessed no inconsiderable power both of poetic 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 Fingarette.

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 Sodan the place of his birth. He was descended from a Scotch family, which, on account of its participation in the rebellion of 1745, was compelled to seek refuge in France. He was entered as a private in a regiment of dragoons, 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 Mon. Jacob, who warmly espoused the republican cause. His military talents procured him a place at the commence ment of hostilities on the staff of General Dumouriez, and he rose to the rank of Captain after the battle of Jemappes; some historians however state that his valor on that occasion was rewarded with the rank of Colonel. He served in the campaign against England in 1792, 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 was summoned to 1796, Vol. II. - 2 K
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 that city. His behaviour in one respect was approved by some patriots, but his position was one of extreme difficulty. On the approach of General Mack he was obliged to abandon Rome, and his army was attacked by the enemy at Oriolo; but the Austrians however were compelled to retreat before the superior force of Suwarrow, he saved the army, and reconstituted it to France by a retreat in which he displayed considerable skill. (Suvarov, 27, C.)

Macdonald had command at Versailles during the period of the revolution of the 18th Brumaire. (Bonaparte, F. C.)

In 1800 he was appointed commander-in-chief of the army of reserve in Switzerland. His celebrated passage of the Splugen, the diversions 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 across 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 displayed the qualities that rendered his name memorable, while he had less means at his command to surmount them. (Alison, Hist. of Europe, c. xxii.)

In March, 1802, he was appointed French ambassador at the court of St. James, 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 General towards General Moreau. (Bonaparte, F. C.; Morau, 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. Here Macdonald on the occasion made such a noble use of the opportunity of renewing his military reputation. The troops under his orders entered Styria; he compelled the Austrian general Meerfeld to capitulate at Lajauch (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 and singular engagement, Napoleon, as he passed by Macdonald on his return to the capital, stopped, and, 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 presented him with the marshal's staff. On this field of battle two of the most distinguished regiments of the national guards, services, Marmon and Oudinot, who afterwards obtained the respective titles of Tucque of Ragusa and Reggio. It is also added that Macdonald with affectionate gratitude for the honour conferred, and especially for the manner in which it was conferred, pledged himself to abide by the dictates of Napoleon for life or death.

He was afterwards appointed governor of Gratz, whereby 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 their and his daughter, and who was about to be married. This gift however he nobly refused, and added that the best proof of their gratitude towards him would be shown by their care of three hundred sick soldiers, who had been reduced to have been left alone, to 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 Torton (March 29, 1810), he was one of the prisoners on board the Leipsic, which was proceeding from Livonia to Har-}

elona by the circuitous route of Marennes. He was attacked on his march by the Spanish general Sarafild, and his troops met with a determined opposition on the bridge of Mancres; this disaster overcame, 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 houses were destroyed, its public edifices set on fire; and it is to be regretted that Macdonald, who witnessed the conflagration, made no efforts to put a stop to, and offered no assistance to the sufferers. This unnecessary cruelty was condemned by everyone, and rekindled 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 expedi-}

tion to Russia. In the attack on Riga, which Napoleon gave under his command. In the Saxon campaign of 1813 he distinguished himself at the battles of Bautzen and Lützen. In that of Coalbach (August 29, 1813) he met with a severe reverse. In direct violation of Napoleon's orders, he imprudently ad-

anced against Marshal Blücher, who was at the head of an army very superior in numbers to his own, which was im-}}
and two on Appellations. According to Priscian be also were Ambrose.

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 different classes of society. There is no subject in the present age in which there is more productive of good; and none perhaps in which all classes are so much concerned. Whatever theoretical opinions may be entertained by speculative men, the use of machinery in aid of human labour, or, as some contend, instead of it, is 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 what objects it is extended to be real or imaginary. By some, new every machine is productive of injury to the emotion of the wealth and resources of a country; by others it is regarded as a hateful rival of human industry—as iron contending with ironing steam—as steam fighting against 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.

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.

1st. As to production, it certainly is true that machinery have 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 edit. p. 38.) If, by the aid of machinery, ten men can perform the work of twenty, and so form 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. The same is the case to a great extent with 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 bad 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 great indeed is human inventiveness of the earliest times, has had for its objects the saving of labour and the increase of production. Horses and other beasts of burden were made to work for man; to bear loads which otherwise they must have performed by their own strength, and so make their own strength more must have forced through the soil. To the same object all nature has been made subservient. The stream turns the mill, and does the work of man; the wind performs the labours of man. In their way, the machinery is labour of carrying their goods to a distance, and it is less labour to raw 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 most animals are more active than himself; they can provide 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 must have saved them beyond the heart; but his hands were formed with wondrous aptitude for executing the tasks which reason set them. He invented tools and implements and weapons, and all nature became his slave. He was now able to make his own strength more almost as if he had become stronger and more industrious. He produced more for his own comfort and subsistence, with little labour, than the greatest cutting could otherwise have obtained for himself. He made shoes and clothes for the protection of his body, has increased his strength, and multiplied the productions of his industry; and at length the giant power of steam has peopled the world with inanimate slaves who do his work faster and better than he did it himself with the greatest labour and the most skilful tools.

The flint and fish-bone of the savage, the tool of the workman, and the steam-engine of the manufacturer, have but one common object—to save the labour of man and to render it more the more productive. As far as machinery attains this object the most effectually. Can any one doubt the advantage of abundant production? It needs but a few words to point out its benefit. Whether for man or for God, we are more beyond the payment of the consumption of the necessities of liwe; we all desire comforts, luxuries, and ornament; and in proportion as we desire them we become civilized. The more skilful the man who manufactures, the more exceedingly he farper his arts, his sciences, his polities, 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 collective, 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 supplied, 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. The riches that 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 state, and to act more skilfully and intellectually 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 that the world good and evil are found side by side; but the good, as we would fail believe, preponderates.

When once it is admitted that men are to decently housed and clothed, and an income is to be obtained to enable them to live comfortably as they can obtain, it is clear that the more easily they can obtain them, and the more generally such possessions are enjoyed, the more completely are the objects of civilized life secured. If all men could obtain them easily, there would be no poverty, and essentially 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 sons and grandsons are more commodious and often better than were the houses of the rich three centuries ago. If this increased facility of acquiring the comforts of life had been accomplished by greater profusion and frugality, we believe that the benefits derived from the latter would have more easily been appreciated, but the former is more readily, and is more splendidly shown by the improved condition of all the working classes of this country; but more money has been squandered by them in popinign spirits, within the last fifty years, than all the money the parents of the rich men of that time could have saved, and the money would have been more to the benefit of the state.

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 forego one enjoyment in order to obtain another. If his shoes or his coat be worn out, his dinners must be stinted perhaps until he can pay for a fresh supply; and thus, unless his wages be reduced in consequence of the cheapness of such articles, he is beyond all question that cheapness is an extraordinary benefit to him, the money which he saves in the purchase of one cheap article is laid out upon another, and thus, without privation, the demand that which his industry brings rain 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 people, the more they have to offer in exchange, and their
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. Too many men were employed in any department of industry; 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 of production, and consequently to the same laws of supply and demand, as those produced by hand labour. 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 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 husbandmen would be disappointed at the unfor- tune results of their industry, but would they complain of the fertility of the soil? It would not be the soil that had caused their own misfortunes; and age 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 productiveness be brought into open competition with carelessness, it causes the evil (whose effect is not unknown) of glut.

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 carries the lessening of injurious competition, by increasing the quantity of human subsistence. But these benefits will be neutralized if, while it cheapens production, it has a tendency to diminish the means of employment for the people and the wages of labour—and this leads us to the second part of our inquiry: the advantage of such an influence may be estimated from the following facts:

In no trades has machinery been so extensively introduced as in the manufacture of silk. Indeed, the manufacture of silk, as Mr. M., has the population increased so rapidly as in the principal seats of those manufactories. Between 1801 and 1841, Manchester increased in population from 90,886 to 296,183, or 305.6 per cent; Leeds from 53,162 to 181,874, or 242.5 per cent; Bradford (York), from 6938 to 14,684, or 111.5 per cent; Huddersfield, from 2268 to 7268, or 225 per cent, and Wigan from 1202 to 3760, or 213.5 per cent. These results, however, are only the effect of the cotton trade, increased, in the same period, from 75,722 to 294,269, or 221.5 per cent; Leeds, from 53,162 to 181,874, or 242.5 per cent; Bradford (York), from 6938 to 14,684, or 111.5 per cent; Huddersfield, from 2268 to 7268, or 225 per cent; and Wigan, from 1202 to 3760, or 213.5 per cent. Thus far the manufacture of cotton, oil, 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 190,438, or 146.2 per cent; Sheffield, from 31,314 to 65,186, or 117.6 per cent; Wolverhampton, from 12,665 to 36,389, or 189 per cent; Merthyr Tydvill, from 7705 to 54,947, or 643 per cent; and West Bromwich, from 5685 to 26,121, or 265 per cent.

In this extraordinary ratio has the population increased in the seats of our staple manufactures, which by the aid of machinery have supplanted the whole world with articles wrought by hand. The interest of the late Dr. M. has been in these places with those agricultural counties in which machinery has exercised the least influence, and let us see if the absence of machinery has been equally favourable to the support of a large population. According to the above-mentioned investigation, Devon increased 55.3 per cent; Somerset, 50 per cent; Norfolk, 50.9; Lincoln, 78.5; Essex, 52; and Suffolk, 49.6 per cent. The average increase of these six agricultural counties did not exceed 26 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. Manchester, Liverpool, York, W., Stafford, Chester, and Durham, including all the agriculturalists, increased 112.5.

These facts prove conclusively that machinery, so far from diminishing the aggregate amount of labour engaged in the 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 increased wages of an agricultural labourer with that of operatives engaged in the infinite variety of trades carried on in manufacturing towns, in connection with machinery: but it is sufficient to ask, whence has come the increase of wages? From machinery, and how can machinery, which has been comparatively insignificant if thousands had not been attracted to the towns from other places. And what could have induced them to leave their homes and engage in new trades but the employment offered by more certain employment and higher wages?

It has been shown that machinery has had a beneficent influence upon the employment of labour in the particular trades
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in which it has been used, and it now remains to consider its effect on the general population. 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 workmen, and an amount saved by the labour of these 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 cultivators of the soil 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 said that machinery cheapens production by reducing the amount of labour 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 is thus dispensed, either for increased accumulations of that portion of capital which has been set free, or for 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 in labour. As long as a person can extend 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 his profits. There is no truth more certain than that an employment of labour is small or great according to the proportion which capital bears to the number of labourers. Capital is the fund which supports labour, and which must employ it or use productive; and, 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 10,000/, which he is expending annually upon labour in a particular trade in his native city; and suppose wages to be 500/ a year. Each year his whole capital is expended, and he makes as much of new accumulation as he has not employed. If he had an additional machine which should cost 5000/, and the 10000/ 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 the same position 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 for him previously that the profits should be at least 11,000/ 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 5000/ only: vice versa, 5000/ profit upon his 10000/ invested in the 10000/ machine is as productive as ten per cent. of the whole 10000/. For some time he will most probably obtain more than ten per cent. profit, and so long as he is able to do this, his means of accumulating fresh capital in addition to his machine will extend the employment of labour not only upon local additional trade. But when his profits had been reduced to their former rate by competition, society has gained in the price of his goods 4500/ a year, being the difference between labour of 11,000/ being realized by 11,500/, and 5000/ at present. But is this amount thus gained by society lost to the labourer? Unquestionably not. As a consumer, he participates in the advantage of low prices, while the amount saved by the manufacturer of machinery must be extended upon others which can only be produced by labour. It cannot be too often repeated, that all capital is ultimately expended upon labour; and whether it be real, in the sense of the accumulated capital of the manufacturers, or as an indirect expenditure in the small portions throughout the community, directly or indirectly it passes through the hands of those who labour. If a manufacturer accumulates by means of higher profits, he employs more labour. If the profits of the poor man, who employ less in the community, they employ more labour in other forms. So long as the capital is in existence, it is certain to have an influence upon the general market for labour.

We are now speaking not of the interests of particular workmen whose temporary sufferers caused by the use of machinery we have already adverted, but of the general and permanent interests of the working population of a country. As regards these, the statistics of British industry fully confirm all reasoning from principles, and prove beyond a doubt that machinery has had a beneficial influence upon the employment and wages of labour. Any one who will reflect upon the facts which have been before us, as well as those given by the Census [Census, P. C. S.], can scarcely fail to arrive at the conclusion that without machinery England could not have supported her present population, or could only have supported it at the expense of the comforts and comforts of those who labour. In other words, the whole wages of the country and the social causes, which are intimately connected with it; were it not for the operation of machinery, would have been of such a nature as to have debarred the masses of the society it would be out of place, at present, to inquire; but enough has been said to show, that machinery by increasing production multiplies the sources of enjoyment, and places them within the reach of a greater number of persons; and 2dly, that by giving increased employment to labour it enables more persons to enjoy those comforts which it has itself created. These are the elements of social prosperity, and if evils have been seen in the past, it is because we have not understood that machinery is not machinery which has caused them. Whatever the influence of machinery has been felt, wealth has advanced with rapid strides; and though in too many cases religion, virtue, and enlightenment may have lagged behind, the tardiness of their progress is to be ascribed, not to machinery, but to the frailties of institutions of men.

MACKENZIE, HENRY, was born at Edinburgh in August, 1745. 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 1762 entered the Scottish Court of Exchequer, a department of law-business which is now all but extinct, and which even then was extremely limited, and conducted by a very few practitioners specially appointed for the purpose. He held this office for about two years. To the former Mr. Mackenzie contributed forty-two papers; to the latter fifty-seven. Among these are his small novels, such as The Story of La Roche, and a kindly kindred, and a very few that drew the attention of Walter Scott to German literature. The Highland Society likewise published in their Transactions an address of Mr. Mackenzie to the ocassion of the Omeiotic Controversy. In 1783 he published the first 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, 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; and 'The Black Bird,' which had declined to bring on the stage on account of the harrowing nature of the catastrophe; and 'The Prince of Tunis,' which had been acted at Edinburgh with much applause in 1778, and printed separately the same year.

The work, when published in 1808, was written for a political writer. 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 1806 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 heard to say, '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 possessed his imagination, was to proved a way to provide the habits of thinking and feeling, such as a man of business may unite with literary tastes and with a fondness for literary amusement. Indeed that tendency to stickly refinement, which characterised his prose compositions, and novels, indicated the want of the vigour of mind essential to success in the highest walks of literary invention; and he is not the only case in which genius of this cast has put forth all its strength in youth, and been overtaken by the currents of life.

Accordingly, for many years, Mr. Mackenzie's leisure was spent either in the society of literature and other friends, or in shooting and fishing, sports to which he was particularly addicted. He 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 Lodovick 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, 1819, in his eighty-fourth year.

MACROCHEILUS, a genus of Fresh-water Fishes, proposed by Prof. UX tollis (Polichas Fossilis of Denison) to include several species which occur in the Devonian and Carboniferous strata.

MACROPOMA, a genus of fossil fishes proposed by Agassiz: the species belong to the cretaceous strata.

MACROSTOMUS, a genus of fossil fishes proposed by Agassiz. From the odontol.

MADNESS. [Iskallit, P. C.; Lunic and Lunicum Attics, P. C. S.]

MAECIUS, LUCIUS VOLUSIUS, a Roman jurist, who lived in the time of Antonius Pius and Marcus Aurelius. He was one of the legal advisers of Antonius (Capitolinus, Antonius, Pius, 12), and one of the instructors of Aurelius in law (Capitolinus, Art. Philosoph. 3). He was held in high estimation by Aurelius, as appears from a Rescript of the Divi Fratres, in which he is styled their friend and a most careful student of the Civil Law (Dig. 37, tit. 14, s. 17). He was also a friend of the jurist Julianus (Dig. 35, tit. 2, s. 1, 6). Both were ordered by the imperial governor of Alexandria by Aurelius, for Vulcanius Gallicanus, in his life of Avitus Casius (c. 7), mentions a Maccius who was put to death there by the army for joining in the rebellion of Avitus. Certain writings of Maccius which are mentioned in the Florentine Index are sixteen books on Fideicommissa, and fourteen on J udicia Publica. There are 44 excerpts from Maccius in the Digest. His Libri Quasi- testamenti (Digest 27, tit. 5, s. 8, and commentary, or something of the kind, on the Lex Rhodia de Jactu (Dig. 14, tit. 2, s. 9). Maccius is cited by Tapiamnus, Ulpianus, and Paulus.

An extant treatise, De Asse et Ponderibus, is supposed by some writers to belong to another author of the same name.

MAGIC LANTERN is a species of luminescent microscope, its object being to obtain an enlarged representation of objects placed in its field of view. This apparatus is generally placed in a darkened room, by means of the pencils of light issuing from a lamp or candle and passing through a convex lens.

The instrument consists of a lantern, generally of tin, and of a cylindrical box, provided with a small rectangular opening, and at a perforation in one of the sides is applied a tube projecting horizontally from it. Immediately before the aperture, and within the tube, is a glass lens, often nearly a hemisphere in diameter, serving to condense the light which proceeds from the lamp both directly and by reflexion from a concave mirror attached to the side of the lantern which is directly opposite the aperture: this tube carries within it another, which is also provided with a convex lens, and is capable of a small movement for the purpose of adjustment.

A groove in front of the lantern and parallel to that front receives a rectangular frame containing the glass plates on which are painted, with transparent colours, the objects of which an enlarged view is to be obtained: and, as the amusement of young persons is chiefly intended by the exhibition, picturesque figures are usually those which are represented. Instead of a single convex lens, the sliding tube is sometimes provided with two such lenses; these are placed at a little distance from one another, and have between them a perpendicularly placed convex lens, or pair of lenses, of such a focal length that the rays in each of the pencils which proceed from the object may unite on the screen and thus produce the enlarged representation of the object.

Several figures are usually drawn on the same plate of glass, and the plate is capable of being moved by hand in the groove so that the different figures may be brought successively into the same position: thus can be exhibited various scenes relating to one subject, which is generally some absurd fiction. Persons who make their occupation to exhibit the magic lantern very frequently give, with the representations, descriptions of the objects on the screen; and these being expressed in a peculiar jargon, and in a certain degree to the amusement of the company: they frequently also, for the purpose of heightening the effect, give, by a simple\n
work, motions to the figures which are painted on the plates of glass.

This ingenious toy, as it may be considered, is said to have been invented by Kircher, in the seventeenth century, and it is described by him in his 'Ars Magna Lucis et Umbrae.' The celebrated Euler proposed to substitute for the lens in the magic lantern a concave mirror, perforated in the middle like that of a Gregorian telescope, and placed in the interior of the lantern with its polished surface towards the light and its convexity towards the object. The light was supposed to pass through the aperture in front of the lantern so as to fall on the screen; and 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 refracted light alone.

A remarkable improvement in the manner of employing the magic lantern was first exhibited in London in the year 1802, a machine being exhibited which serves for general purposes; and the sliding tube which carries the fattest lens has a greater range of motion. The objects to be exhibited are painted upon a glass plate, which is at a proper distance from the machine. When the machine is placed upon a stage which is capable of moving on wheels in a direction perpendicular to the screen on which the objects are represented.

The screen is usually made of 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 this being made quite dark, the spectators occupy seats arranged round the screen, which is illuminated by the light which is thrown upon it from the machine 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 possi-
albly, 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 propor-
tion as the aperture on the screen is diminished; but 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 coun-
terbalance 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 from the lantern, and that the magneto-meter, which coincides with the central axis of the cylinder, a point which, in proceeding from the lantern, produces the image to be observed; and the screen being itself invisible, the specta-
cors 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 ap-
parently in the immediate presence of the company, perhaps surrounded by a blaze of light, they seem as gradually to re-
tire, and at length they vanish, leaving the place in profound darkness. The effect of the exhibition is, moreover, heightened by the accompaniment of mournful or inspiring sounds, according to the character of the object, from musical instru-
ments disposed for the purpose.

Spectacles are frequently exhibited in this manner; but occasionally the lights and the background, care being taken that the personsages are shown; and the illusions produced have caused the name of Phantasmagoria to be applied to the apparatus.

MAGISTRATE, a word derived from the Latin mag-
istratus, which contains the same element as magnus and ma-
gistratus, and signifies both a person and an office. A Roman
magistraturis 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 Magistratibus originally, and on their ex-
pulsion the two consuls were the Magistratibus. In course of
time other offices were created; and those who filled these offices were elected in the
forms prescribed by the constitution, and they had juris-
dictio. [Jurisdiction.] The original notion of a magistra-
tus, then, is one who is elected to an office, and has juris-
dictio.

In England the term magistrate is usually applied to
justices of the peace in the country, and to those called police
magistratibus, such as are there 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
description, which is given to the judicial powers under
which assembled, and so far as it differs from a justice of the peace; he also exercised delegated
power in his jurisdiction, in which respect, as well as being
elected, he differed from the king of England, who is not
elected but appointed to the delegated jurisdiction, but
depends jurisdiction to others.

MAGNETISM, ANIMAL. [Animal Magnetism, P.C. and F.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 de-
termine 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 nature of the determination.

The declination magnetometer is of various sizes; for
general purposes it is from 12 to 15 inches long, 1 inch broad,
and 1 inch thick; but that which is mounted in the Green-
wich observatory is 2 feet long, 1 inch broad, and 1 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 upper part, has a triangular aperture through which
passing, in order that it is applied, on 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 stand or near the ceiling of the apartment, and, afterwards
descending, passes through a graduated cylinder, from which
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 mag-
netic bar is a slidding 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 of the first. By moving the
magnetometer 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
magnifying glass. When the magnetometer coincides with the
wire in 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 gene-
 rally 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 hori-
tonial 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 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
axis makes with the plane of the magnetic meridian is then
observed, and the difference between the angle of the bar from
it, is turned round on its vertical axis till the detorsion bar
is brought to that plane. Thus the torsion of the fibres
is nearly obviated.

In order to find the point on the graduated scale which
corresponds to the magnetic axis of the magnetometer, the
latter is placed in the stirrup; and, looking through the tele-
scope, the observer Remarks the graduation of the scale which
coincides with the vertical wire in the field of view: this
observation is made with the magnetometer in a reversed
position; and then half the sum of the numbers on the scale
with the axis, which is called the zero, is noted. The
directions of the readings converted into angular space (the distance of the tele-
scope 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 and 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
axis in relation to the magnetic axis of the magnetometer,
and like it furnished with graduated scale and lens, is placed
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 axis 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 mag-
netometer 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
development 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 it
coincides with the vertical circle and 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 hori-
nontal force of magnetism, by which it is drawn to 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 magnetic meridian is to the angular distance of the bar from
the magnetic meridian, which is equal 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,
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:

\[ \frac{dF}{F} = -\cot \theta \, \varphi \, d\phi, \]

in which \( F \) is the absolute horizontal force, \( dF \) its variation, \( \varphi \) the angle between a vertical plane passing through a line connecting the two extremities, and a line 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. \( \frac{dF}{F} \) 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 axis perpendicular to its length, and has its lower part, on each side, reduced to an edge. This knife-edge, as it is called, is passed 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 pedestal, which rests on the base of the instrument. For the adjustment of the bar, a small arm is attached 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 backwards or forwards 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 being 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 plate with some dimensions m is attached to the bar, and 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 thread wound on the bar is then passed through the telescope, which is fixed to the side of the bar, and the telescope is turned till the cross wire 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 moved, 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 intersection of the line passing through the magnetic axis of the bar which is applied to the opposite side of the apartment; and, the telescope being directed to the mirror, in proportion as the magnetic needle shows more or less from the meridian, the number 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 halve of the skin of silk by which it is suspended: these parts are each about 8 feet long. An oblong ring of copper, which entirely surrounds the magnetized portion of the instrument, is furnished with two rings which on the scale appear in coincidence with a wire in the telescope, and 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 skin of silk by which it is suspended: these parts are each about 8 feet long. An oblong ring of copper, which entirely surrounds the magnetized portion of the instrument, is furnished with two rings which on the scale appear in coincidence with a wire in the telescope, and diminish. Thus the variations of the horizontal intensity are obtained.

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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.

The 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 horizontal force magnetometer in the east, and the vertical force magnetometer 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 they may be pointed to each other, 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 botanical garden of Montpellier. He was born in 1638, and died 1715. He gave an account of the plants growing wild about Montpellier, in a work entitled 'Botanicon Mon-tpellensae; seu Plantarum circa Monspelium nascentium Index,' 8vo., 1686. This work was illustrated with plates, as well as one published in 1689 with the title 'Prodomus Historiae generalis Plantarum in quo Plantae per Familias distinctae sunt, Observationes in singulas, et Systema a me inventum et a me exhibita,' fourto, in which he described the trees of his own. In another work embracing the plants growing in the Montpellier garden, entitled 'Hortus Regius Montpel-11,' he has described the trees according to the system of Linné.

The genus Magnolia is the type of the natural order Magnoliales. It has a calyx of 3 deciduous sepals that resemble petals; the corolla is composed of 6 to 9 petals; the stamens and pistils numerous; the carpels are disposed compactly in spikes, opening by the external angle, 1-2-seeded, permanent; the seeds baccate, somewhat cordate, pendulous, hanging out beyond the carpels by a very long unilh shaped white thread. The species are arranged in 2 groups, the first with alternate, stipulate, deciduous, or evergreen simple leaves, and large terminal solitary odoriferous flowers. They are all natives of North America and Asia.

M. grandiflora, commonly Called 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 9 to 12 petals expanding. This plant is one of the tallest and handsomest 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 there are now, in all the better ordered gardens, 15 to 20 of them. Several varieties of this species have been named and described. Amongst the most constant and best known varieties are: 1. M. g. obesa; 2. M. g. Eschmennia; 3. M. g. americana; 4. M. g. purpurascens. The last is found in the Carolinas by the name of the Big Laurel; the second is the Exmouth Magnolia; the third and fourth are varieties which have been produced in France.

M. glauca, deciduous, or obtusifolia, is an almost odoriferous plant, with obtuse elliptical leaves, glaucous on the under surface; the flowers from 9-12 petalled, contracted; the petals oviolate, cuneate. This species is a tree rising from 15 to 20 feet in height. It is a native of New England, in low moist swampy ground at a little distance from the sea, from Massachusetts to Florida and Louisiana. This plant is also cultivated, and a number of varieties have been described. The bark has a bitter and aromatic odour resembling cassia. On this account it has been used in America as a substitute for other aromatic hitter barks as Cascara, Cassia, &c., and is said, with great success. Although not much used in Europe, it is said to possess many medicinal properties. It is used in the treatment of rheumatism, ague, and remittent fever have been given. All the species of Magnolia possess more or less the properties which are most evident in M. glauca. When used, a tonic effect is produced, and colds, or colds connected with them, are equally alleviated. It is said that when the tincture is made from the leaves and stems 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 Keissberg states should be smelt at a distance of 100 miles. The flowers are followed by red berries, which give the tree a handsome appearance. The berries are steeped in brandy 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 wanting. It is a native of North America, from the Carolinas to Virginia, and New York. The leaves are 1 to 2 feet long, placed at the ends of the branches in a circular manner, somewhat in 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 from 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 green, but not remarkable for their beauty. The fruit is about three inches long, and it is supposed that the name 'acuminata' was given because of its resemblance to the cucumber-tree, whence in America it is called Cucumber-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 graft 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 cultures. Of 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. auriculata, Indian Physic, or long-leaved Cucu- mber-tree, having white flowers and a bitter bark, which is used as a medicine by the Indians.

M. Yulan, or conspicua, a deciduous tree with obvate abruptly acuminate leaves, the younger ones pubescent, expanding after the flowers, the flowers 3 to 6 petals, the styles erect. This plant attains a height of 30 or 40 feet in its native country, but reaches only 8 or 10 feet in our gardens. It grows in China, where it has been cultivated since the year 627. Its native name is Yulan. It is a very showy tree, having white flowers sometimes suffused with purple, which give out a most delicious perfume. It blooms in this country from February to April, and is distinguished from M. glauca, the common Magnolia, by the number of its petals. It is not so quite so hardy as the American species; still, unless the weather is unpropitious, it will put forth an abundance of blossoms during the dreary months of February and March. The flowers smell very strongly, and make a very fine shrub, with obvate acute reticulately-veined leaves, almost smooth; the flowers erect, of 3 sepals and 6 obvate petals; the styles very short. This plant is a native of Japan, and seldom attains a height of 10 feet. A petal of this tree, when bruised has an 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, when 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 planted or hedged on M. obesa. 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.

(Door, Gardner's Dictionary; London, Encyclopaedia of Trees and Shrubs.)

MahaDeya. [Siva, P.C.]

Mahmud II., Sultan of Turkey, the younger son of Sultan Abdü'l-Hamid, or 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 Mustapha IV., on the 28th of July, 1808. He has been shown (Turkey, P.C.) how very agreeable Sultan Selim, the uncle of Mahmud, was disposed and imprisoned in 1807 on account of his civil and military reforms, and that Mustapha had no sooner succeeded him than he abolished the new institutions of Selim, especially the Nizam ed-Daulah, or the Constitution of 1789, into which the European principles. Mustafa Raimkar, pasha of Rusejik, Vol. I. 2 L.
an old friend of the deposed Selim, strongly objected to the policy of Sultan Mustafa, and no notice being taken of his remonstrances, he assailed his head. The sultan, who thought that by removing the object of his revenge, he could the more easily crush it, was assassinated by order of Mustafa, who, it is said, foretold his nephew's future elevation, and initiated him in those principles of reform through which he had endeavoured, though in vain, to reunite Turkey. Mustafa was also imbued with that deep hatred of the Janissaries which was one of the leading principles of his future actions. Mustafa ascended the throne when Turkey was in a violent political and social crisis. In consequence of the enlightened but weak government of Selim the prejudices of the people were aroused without meeting with a power sufficient to keep them down; the sultan's authority was disregarded 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 who looked upon the deposed Sultan Selim, or the deposition of Mustafa, as, 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 reformation of Selim, and by choosing Mustafa Bailraktar 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 the sultan was governed by principles more enlightened than Selim. When the turn of the Janissaries came, they broke out in open rebellion, and besieged Mustafa Bailraktar, whom they believed to be 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 ten thousand men not a month old were pregnant, four in number, were sewn up in leather sacks, and drowned in the Bosphorus. These murders Mahmud became the only male descendant of Osman. He was an unhappy prince. Yet he had no higher thought than the glory of Turkey, and he made his 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. He 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 revoked; and Czarina George raised the standard of independence in Servia. Mahmud, although desirous of peace, was forced to make peace by the growing 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 great mistake of not keeping his word. 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, and he would perhaps have continued the struggle, had the strong remonstrances of England, which were backed by a large fleet in the Mediterranean, been successful. Under these circumstances he made peace with Russia at Baku, on the 28th May, 1812, on conditions not favourable 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 Caucasus; 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 Tsar 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 execute the resolution of Mahmud, whom he had told of the news of the peace of Baku, 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 which Selim had attempted, and which his friends Berber Bashi and Khalet Efendi. He succeeded in keeping down the rebellious spirit of the pashas of Baghdad, Damascus, Widdin, and Silistria; and he received good news from France, for Napoleon, who had promised the return of the Crimea, was about to make a new campaign, and would rouse the Turks of the Bosphorus, who had seized it. His attention was chiefly directed to 'Ali Pasha of Janina, whom he watched with great suspence, being convinced that sooner or later that great feudatary would make a hostile movement against England, and that the Turks would be no longer an object of confidence. His conduct towards 'Ali Pasha was signalized by that mixture of craft and frankness which is so striking in the character of eastern nations; and while he deprived the sons and grandsons of the founder of the empire of their wealth and hereditary rights, he still professed to be a friend of 'Ali himself, till the moment came for enmaring 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 foes 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 Mehemed 'Ali of Egypt, and an open rebellion of the Greeks.

The Greek revolution began first. The attempts of Alexander Ypsilanti in Wallachia, and of the Greeks of Constantinople, who, having escaped from their Turkish 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, with professing Mehemed 'Ali's promise that he should be invested with Candia as soon as the object of the campaign was attained. An Egyptian fleet, with an army of 12,000 men, commanded by Mehemed 'Ali's son, Ibrahim, the conqueror of the Wahabis, sailed for the Peloponnesus, and the combined Turkish and Egyptian forces committed those atrocities which roused a cry of indignation throughout Europe, and induced Great Britain, France, and Russia to interfere on behalf of the unfortunate Greeks. Mahmud, bent upon crushing all rebellion within his dominions, and making himself equally respected by both his Turkish and Christian subjects, declined any 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 promised to submit to that condition, but the sultan's proposition was rejected. Upon this the combined British, French, and Russian fleets attacked the Turkish-Egyptian fleet in the bay of Navarino (20th of October, 1827), and the idol of Turkish pride, 'Ali Pasha, who had died in Mehemed 'Ali's arms, was sunk. Mahmud, who had always made peace with his enemies, now turned to his adversaries. A French army now landed in the Peloponnesus, Ibrahim Pasha evacuated the country, and Greece, without being independent, was left free from Turkish invaders.
MAH

holy war against Russia, well-knowing that the insurrection in Greece was in a great measure the work of the Czar. Before, however, we proceed 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 his dominions were riddled with a thousand abscondions and by the interference of the three powers in the Greek insurrection. At this time he proceeded so openly with his reforms as to leave no doubt of his firm intention to overthrow the existing state of things with the utmost pertinacity and to establish a new and more stable state of things. He had musical and theatrical entertainments performed in the seraglio; he dressed in the fashion of Europe, and abandoned the sacred turban for the fez; and, to the astonishment of his own subjects, he was known to have conferred orders of the most exalted description upon other Nizam Jedd, or Azaiîr Mahmudzey, as he now chose to call those troops. When he signed that order he had likewise resolved to destroy the Janissaries, who did not allow him to wait for an occasion to begin the contest. On the 15th of June, 1826, the sultan and the grand vizir 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-Medîdan, and thence marched in battle array to the palace of the grand vizir, which they took and burnt after a feeble resistance on the part of the domestics, who were cut to pieces. The vizir's women escaped by hiding themselves under the walls. The heads of the grand vizir and the vizier hastened to Constantinople as soon as he had heard of the riot, informed the absent sultan of the event, assembled the divan, and concurred in round the seraglio all the troops that he could raise, and paid with the Nizam Jedd I will we have the heads of all those who advised the sultan to introduce new institutions! soon reached the ears of the [.] 1 The vizir, 'Abd al-Khâ近视, or the meraggers of the seraglio. Thither crowded the 'ulems 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 vizir sent an answer to the rioters, that he would not satisfy their demands, but would repel force by force. The Janissaries were propitious to an attack upon them, when he the 'Arrâf of Kadhînah, or the Janissaries in a small boat from his country-seat at Beshik Tash, on the Asiatic side of the Bosporus. Fully aware of the danger of his position, 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 vizir 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 kiosk on one of the outer walls of the seraglio. On his order the muti unfolded the 'sanîjak sherriff, or the standard of the prophet, and hundreds of 'chachâs,' or cries, dispersed themselves through the streets of the city. The sultan, accompanied by M罕medzey, proceeded to the Et-Medîdan 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 no sooner had the Janissaries seen the troops of the sultan than they dissolved the detachments which the Janissaries had placed in all the streets leading to that mosque, for the purpose of isolating the grand vizir. At the sight of the holy standard the Janissaries concentrated their forces in the square, round the Et-Medîdan, and threw up entrenchments. Ilseâz Pashâ, Ibrahim Pashâ, and Mohammed Pashâ, who summoned them by order of the sultan, to lay down their arms, were received with a terrible shout and narrowly escaped assassination. They were strong enough, they said, to defend themselves till the evening, and the coming night would bring destruction upon the reformers. Two thousand houses in flames were burnt, and the shouts of the crowd were heard with a loud voice the first chapter of the Korân, the 'Al-Fâtihat,' the shortest chapter of the Korân, which is held in as much veneration by the Mohammedans as the Lord's Prayer by the Christians. The men of the sultan's party, who had proved most loyal under such trying circumstances he founded a new order, the Nîshûf Istatb. In 1821 hostilities commenced with Mahmud 'Ali, Ibrahim Pashâ having made war against the Pashâ of Egypt. It was now the first time that there was open war till 1832, on Mahmud 'Ali's refusal to withdraw his troops from Syria. The declaration of war took place on the 16th of June, 1831, and on the 26th of July Ibrahim defeated the Turks at Hems; and on the 4th of December he obtained the splendid victory of Koniah, in consequence of which the Turkish army was disbandd, and the Egyptians advanced upon Constantinople, the power of the European powers effected a truce; but in spite of it Mahmud pushed on and occupied Brusa. 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 Lazareff, whose arrival stopped the progress of Ithurbide. On the 4th of May peace was concluded at Konia, and Mahmoud 'Ali obtained the object of his armament, the invasion of Syria. Adana, he resigned the tributary vassal of the Porte. So much was Turkey weakened through this war, that Mahmoud, despairing of further independence, threw himself into the arms of Russia, and on the 8th of September, he trekked to the Russian stele, by which Russia bound herself to assist Turkey with an army whenever she should want it, in acknowledgegment of which Mahmoud promised that no armed ship of foreign nations should be allowed to take up quarters in the Porte. Erdogan of Russia Mahmoud 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.

Mahmoud's hatred of Mahmoud 'Ali began now the principal motive of his actions. As early as 1834 things were so bad, that Mahmoud not only resolved upon a fresh war, but the himself at the head of his troops to conduct it in person. But in crossing the Bosporus he dropt the sacred sword of Soliman II., which fell into the sea and was lost for ever, and this act he committed, he says, because he had resolved to return 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 he feared, but the contest 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 well conducted, and 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 Mahmoud 'Ali he was the victim of the knavery and rapacity of some of his ministers, especially the old Khoorew Pasha, without ever suspecting how unfairly he had been dealt with. Sufficient money was intrusted to Khoorew to defray the expenses of the war, and the strictest order was given as to the expenditure. He failed, but Hussein Pasha, who commanded part of the army, received only a scanty supply of ammunition, most of the ammunition wagons which were sent to his camp being found empty at their arrival. Mahmoud also gave 4000 purses to Khoorew, directing him to send them to Hussein, who had received orders to pay for the provisions and horses, which he should be obliged to take from the peasants; the money, however, remained in the hands of Khoorew, and when, after the end of the campaign, Hussein returned to Constantinople, he did not dare to complain of the peculation of the powerful minister. Reshid Pasha, another commander, received the most solemn assurances that he would get for his army, which was sent to the Turkman Pasha, in the different towns of that part of Asis 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 Turkman Pasha.

The second war with Mahmoud 'Ali would perhaps not 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 25th of June, the Turkish army under Hafiz Pasha was entirely defeated by Ithurbide Pasha, near Nisibis; and there being no other army to oppose his victorious career, it was evident that Turkey was lost if the European powers did not interpose. Mahmoud was fortunately not desired 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 Nisibis threw the seraglio and the capital into consternation. It was after the passage of the Bosphorus by Dikablos, in 1828, that for the first time in his life Mahmud evinced symptoms of despair. From that time care and disappointment produced a visible effect upon him; after his defeats in the first Egyptian war he threw himself into a state of dejection and dispair, and declared of Mahmoud 'Ali impaired both his body and mind. At the beginning of 1840, his health was so bad as to indicate a speedy dissolution, and he increased his weakness by excess in food. His eating was of the most extravagant kind; he declared his aliment to be tuberculous phthisis; shortly before his death they were dismissed, and, as the younger Michael in the 'Biographie Universelle,' says, were superceded 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. Mahmoud was succeeded by his eldest son, Abdul-Mejid, the present sultan.
he went great no limits to our nation's success and years by those of number, namely infinity.'

(Salton Malamud and Malamud's Ali Pasha, by the authority of France, Russia, and Turkey, 3rd edition, London, 1835; Von Hammer, Des Osmanischen Reiches Staaten-Verfassung und Staats-Pflege von bedenken in the text, and another accident which happened to two which he made for the latter king made Mariano to give up the art of inlaying in disgust. These two chests or caskets 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 which the works were subject to destruction was also a drudgery unworthy the attainment of superior abilities, and he thereupon applied himself exclusively to sculpture in marble and to architecture.

Benedetto's marble works however were also of an ornamental character, diverse in detail, and of great variety, in the taste of the Renaissance. He first made a group of figures for the tomb of Guarino della Scala, and then one of the most famous marble groups in the world, the Virtues, in the Medici Chapel. His figures and pulpits were of a most elaborately, character, being loaded with beautifully executed small figures, besides other decorations. One of his masterpieces is the magnificent marble Nativity which he designed for the cathedral of Florence and which he finished the Magdalen in Santa Trinita, which was left imperfect by D'estacore da Sacinaco. In architecture he did very little: he built the porch of the church of the Madonna delle Grazie near Arno; a chapel for himself on his own estate near Prato; and he is said to have designed the Palazzo Strozzi. He died rich in 1498, 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.

GIOVANNI DI NARDO DA MAIANO, the uncle of Benedetto, was likewise a distinguished artist, and in similar works as Benedetto. He was inducted with several important charges in Florence, and in 1472 was elected to the office of Lord of his native city. He was a pupil of Brunelleschi, who was the architect of the cathedral of Florence in 1446. At Naples he built the palace of Poggio Reale, and at Naples and of Madrid, also the triumphal arch, and the relics of the Castello Nervos (now the Arsenal). At Rome he built of Travertine stone the loggia 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, but more charitable persons have presumed that the pope used only such stones as had already fallen. Giuliano commenced also, in 1464, a new nave to the church of the Madonna at Loretto, which was completed by his nephew Benedetto. Giuliano was still living in Florence in 1471, a fact clearly ascertained by Brunelleschi. He was also said to have been a pupil of Filippo Brunelleschi in the reign of Alfonso I. (1435-1458), is erroneous; this statement is also evidently incorrect from the fable of Giuliano being employed by Paul II., who was pope from 1464 to 1471.

(Vasari, Vita de Pittori, etc., and the Notes to the German translation by Schorn; Cipriani, Storia della Scultura; Rumoro, Italianische Forschungen; Maiano, Mastiletto, et al., 1754-1758. [SETTLEMENT, P.C.] MAIATE, MAIATI, Lords of Rimini, an historical family of Italy during the middle ages. Like many other great feudatories of Italy, the Maiati are said to have been of Italian origin in the fourteenth century. One of their names is mentioned in some chronicles as 'Vicarius,' or Imperial Lieutenant of Rimini, under Osso 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 Guelf family in Rimini. Giovanni Maiati, called 'il Zoppo,' or 'the lame,' married Francesca, daughter of Guido di Polenta, Lord of Ravenna. Paolo, brother of Giovanni, seduced his wife, and being caught in adultery with her, they were both condemned to death. This tragic event forms the subject of one of the most beautiful episodes of Dante's Inferno. After many vicissitudes, owing to the factions of those times, we find Gualbert Maiata, in the early part of the fourteenth century, acknowledged by the Pope as Lord of Rimini, Pesaro, Fano, and other places in fief of the Papal See. His descendants continued in possession of Rimini, with various interruptions, till the time of the House of Hapsburg. His family was greatly 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 Maiata had already distinguished himself in the wars of the fifteenth century, between the Duke of Milan and the Venetians. (Sanvoro, Famiglie Illustri d'Italia.)

MALAXIS, a genus of plants belonging to the natural order Orchidaceae, and to the tribe Malaxideae. It has a potent perianth, the lip posterior, erect, entire, similar to the pedale and smaller than the sepal; the spur absent; the stigma rhomboidal; the rootstock acaule, entire; the anthers terminal, continuous with the short column; and the apex of which it appears as if it were excavated with two imperfect cells; the pollen-masses connected at their apex; the germen upon a scale or disk.

Of this genus there is one British representative, M. palea. It is a small plant, with a stem from one to four inches in height. The leaves are remarkable for being fringed at the end with hair, such as hair. The germen are covered with spongy bogs, where it grows upon the moss, in the chambers of an epiphyte, and not amongst it other bog-plants.

MALINGERING. [FRIEDEN DISEASES, P.C.S.] MALLOW, MALVACEAE, C.; MALVA, P.C.S.; MAMMAL, JAMES HARRIS, FIRST EARL OF, was the only son of James Harris, the learned author of 'Hermes,' and other well known works. His mother was Lady Margaret Carteret, and he was born 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 Harrises had been settled on their estate of Orcheston St. George, in Wiltshire, since 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; but they may be considered as having belonged to the first class of the gentry in their county. The father of the author of 'Hermes' married a daughter of the second Earl of Shaftesbury.

After having been put in the first instance to the grammar-school, he 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 above six months, and then sent him to Merton College, Oxford. Since that time, in several 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, contrived to form my mind to think on public affairs, and to give me an 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 gave me, in my own conceit, a knowledge of 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 and conform to college rules.' But although he professes to look back upon the years he passed at Merton as the most unprofitably spent of his life, he appears to have no means altogether neglected a study amidst the heat of living, the desire 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 instruction for one fortnight, when he took it into his head to be taken as a student by the name.

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 amongst his
books, while he also mixed much in society. He then, after being eight months at home, set out in 1767 on a short continental tour, in the course of which he visited Holland, Prussia, 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 charge d'affaires, and, acting upon his own responsibility, he had the good fortune to secure the recall of Sir John Sinclair, the Spanish government 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 temper and firmness, as well as talent, with which Harriet 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 Anyward Cornwall. 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 the two important posts of the English Church, 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 Lord North, Sir John Sinclair and Sir James Harris the part of minister at the Hague, to which it had been 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, and Holland in all probability rescued from the 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 1795, when he formed one of the large body of the friends of Mr. Fox who went over to 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 King of Prussia to enter into a second alliance with England and Holland, which however did not last for quite two years. But he succeeded in negotiating the marriage between the Prince of Wales and Caroline, the daughter of the Duke of Brunswick; and, after having gone through the ceremony of marrying her Royal Highness by proxy, he returned to England. His Diary relates many curious particulars respecting this affair, the issue of which was hardly more unhappy than he had anticipated that in all probability it would be; but his directions left him no option but to take his chance. It is stated, however, that he was never forgiven for the part he acted by the Prince, 'with whom until then he had been on terms of great intimacy and confidence.'

His last missions were those on which he was sent in 1796 and 1797 to Paris and Lille, to negotiate a peace with the French Republic, and which were attended with no result. He was then attacked by a fever, in which, in his own opinion, unhinged him for being again employed on any foreign service of importance. In 1800 he was createdEarl of Malmsbury and Viscount Fitzharris. He died at his house in Hill Street, London, Nov. 20, 1826, leaving a son, who succeeded him in the title, and three daughters.

Lord Malmsbury was without doubt one of the very ablest diplomats of his time, and a man of great general talent. Tall, dark, and handsome, his figure was graceful, and he was said to resemble his mother, Harriet, as St. Thomas More resembled his father, Henry. His manners were kind and gentle, his conversation mild but earnest and impressive, his deportment graceful and polished. It is said he was a Whig and a decided advocate of all salutary reforms, but strongly attached to the institutions of his country, and fearful of all imperfectly considered changes and innovations.

The following is a list of his works in the order in which they were published—

MALMUS, REV. THOMAS ROBERT, was born in 1768, at the Rookery, a small but beautiful estate in the county of Surrey, in the neighbourhood of Guildford and Woking. Charles, 1st Earl of Malmesbury, Daniel Malmsbury, the eldest son of Robert Malmsbury, who was his second son, was never sent to any public school except to the academy at Warrington, and that for a very short time. Besides the instruction which he received from his father, he was for some time under the private tuition of Robert Graves, author of the 'Spiritual Quixote,' whose house, however, he left when young, and was afterwards instructed by Gilbert Wakefield, with whom he remained till 1784, when he was admitted of Jesus College, Cambridge. He took the degree of B.A. in 1788, and that of M.A. in 1797, when he was made a Fellow of his college. Having then orders about the same time, he undertook the care of a small parish in Surrey, near his father's house, but he occasionally resided at Cambridge, in order to pursue his favourite course of study with more advantage.

In 1805 he married the daughter of Mr. Nares, a member for Christchurch, a pamphlet called 'The Crisis,' which however, at the request of his father, he did not publish. It was directed against the government of Mr. Pitt in general as well as against certain measures of the Lord President of the Council. He also published 'An Essay on the Principle of Population,' as affects the future Improvement of Society, with Remarks on the Speculations of Mr. Godwin, M. Condorcet, and other Writers.' The book excited considerable attention; but finding that his facts and illustrations were imperfect, in 1790 he went abroad in search of materials to establish his theory more completely. He settled for a month in the autumn of 1799 at Hamburg in company with three other members of his college, Dr. Edward Clarke, Mr. Cripps, and Mr. Otter. In Sweden the party separated, when Dr. Clarke and Mr. Cripps preceded to the north, and Mr. Malmsbury and Mr. Otter journeyed leisurely through Sweden, Norway, Finland, and part of Russia, and then returned to England. During the short peace of 1802 Mr. Malmsbury travelled through France and Switzerland with some of his relations, observing whatever was curious in nature or art, but especially examining into the state of the people, and collecting materials for the improvement of his work. In 1805, he published a new edition of his 'Essay on the Principle of Population,' with the omission of the controversial parts, but much enlarged in what relates to the doctrine of his father-in-law Mr. Eckersall, at Bath, where he died December 29, 1834. 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 analysis is 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 REALTIES, P. C.

When a boy, while at 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 considerable comic power of imitation; but his character gradually changed: he became more serious, more sedate, but he became placid, temperate, patient, and forbearing under the obloquy which was heaped upon him. His manners were kind and gentle, his conversation mild but earnest and impressive, his deportment graceful and polished. When a Whig and a decided advocate of all salutary reforms, but strongly attached to the institutions of his country, and fearful of all imperfectly considered changes and innovations.
MALUS, ETIENNE LOUIS, a distinguished philosopher and military engineer, was born at Paris, June 23rd, 1775. He received his first lessons under the eyes of his father, Anne Louis Malus de 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 effect. By this means, he obtained a solid 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 could recite from memory all the plays of Shakespeare 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 Academie des Sciences, in the spirit of the times, 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 talent. From some causes, 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 service. He then, as a means of subsistence, entered the army as a private soldier. He was for a short time employed in that capacity, with the battalion to which he was attached, in repairing the fortifications of Heliopolis, which had been destroyed by the advance of the Egyptian forces. Having then obtained a position in the government having decided upon the formation of the Ecole Polytechnique, inquiry was made for a certain number of young men who, having completed the usual course of education, were capable of being sent to the Ecole Polytechnique, and Malus, after being admitted to that institution, was immediately placed in the first class, and recommended to the celebrated Monge.

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 occasionally communicated his mathematical subjects. It is added that he then commenced those researches concerning the properties of light, which prepared the way for his subsequent discoveries in optics; and his first step in this brilliant career was the investigation of the path of a ray of light after being reflected from or refracted into a medium having a surface of any form.

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 a corps of engineers with the rank of captain; and, in 1797, he was sent to the Army of the Sambre and Meuse. He accompanied that army across the Rhine, and was present at the actions of Urkatz and Alten-kirk.

At the termination of the campaign Malus went to Paris, and, in the following year, he embarked with the expedition to Egypt under Bonaparte. He was engaged in the battle of the Pyramids, and in the attack of Alexandria; he was also employed as an engineer at the sieges of El Arish and Jaffa; and, after the taking of the latter place, he was appointed to superintend the repair of its fortifications. While performing this duty he fell ill of the plague, and lay for some time in the military hospital which he had assisted to form; he recovered, however, with little aid from medicine, and he was almost immediately sent to fortify Damietta. He was afterwards engaged in the action for which landed at Aboeiker; he was also at the battle of Heliopolis, at the affair of Cosa, and at the surrender of Cairo.

When the Institute was founded in that city, he was appointed one of its members; and in the first volume of the 'Décade Egyptienné' 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 remise of the French army capitulated, when, in 1801, he returned to his native country in an English vessel. Exhusted by the arduous services in which he was engaged, and having been expatriated and 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 being added to the fortifications of Paris, and then 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 he treated the phenomena of the reflection and refraction of light, and in which he particularly distinguished himself by his experiments and researches concerning the reflection of light in transparent media. It was known that when a pencil of light has entered into glass, or other transparent substance, the internal reflection takes place either before it arrives at the posterior surface, or at a certain distance from that surface on the exterior; but it had been found impossible to determine, though an incapable of the amount of this latter case, which case 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 refraction of the emergent rays, proved that the observed refraction had taken place within the glass, and a transparent medium which, by permitting the rays to pass through the glass, afforded a reflection from the external of the latter.

The subject of double refraction in crystals was very important. In 1810, the Institute of France offered a premium for the best answer to this question and Malus immediately entered with ardour into this field of research. It was while prosecuting his experiments that he observed an interesting phenomenon which only one of genius has 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 angle formed by the pencils of rays 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 from a point source passed obliquely through a crystal, the angle of incidence equal to 45° 35′, 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 the 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 plane of the second refraction is coincident with the plane 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 pencil 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 refracting crystal, those which form 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 Mémoires de la Société d'Arcueil, as well as in the Mémoires of the French Institute. Of this discovery he was immediately engaged; he published 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 Refraction de la Lumière dans les Substances cristallines; and in the following year he presented two papers to the Institute on some remarkable phenomena of polarized light. In the first of these he is shown that when a pencil, after having been obtained by reflection, 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 pieces of glass, and it is observed also that as the whole of 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 the reflection and transmission of light on glass, and that the polished surface acts as a filter.

A particular disposition of the reflecting surface, he succeeded in exhibiting them: he discovered that the pencils reflected from polished metals are polarized in opposite directions, while those which are reflected from transparent bodies are polarized in one direction only. He had observed the modifications which parts of organized bodies, whether animal or vegetable, produce on light when they are thin enough to transmit the polarized pencil through them; and he noticed that the colures, which are sometimes seen in Iceland spar. He ascribed these images to the effects of flares parallel to the longer diagonal of the crystal rhomboid, but Sir David Brewster has since ascertained that they arise from those which act upon the transmitted light at both of their surfaces.

During the short remainder of his life, Malus continued his scientific researches amongst all the duties which his post as a member of the Committee of Fortifications required. He was chosen Examiner in Physics and Descriptive Geometrical Academie 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 28th, 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 three years. Malus enjoyed the esteem of the public for the benevolence of his character.

(M. de l'Académie, Acad. des Sciences.)

MALVA, a genus of plants belonging to the natural order Malvacae. It has numerous styles, a double calyx, the outer one three-leaved, the inner one five-leaved. The flowers are regular and many-celled; the cells one-seeded and circularly arranged.

M. Moschata, the Musk Mallow, has an erect stem, kidney-shaped leaves, with five or seven deep pinnatifid lobes, the lower leaves being oblong-ovate, 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. sylvestris, Common Mallow, has an erect stem, and is distinguished by its kidney-shaped leaves with seven deep crenate lobes; the fruit hairy. The flowers are small and purple colour, much longer than the calyx, which is hairy. It grows on waste places and roadsides in Britain, and is native in most parts of Europe. The whole plant is peculiar, especially the round purple petals, which, when dry, are flat and thick, are employed in dyestuffs and in general for removing supposed acroni- mias, in making tinctures, as a medicine, and in various sizing and polishing. This species is the Malva of Pliny, lib. 20, cap. 21; also, in Columella, lib. 10, cap. 247: it is the Malva of Theophrastus, lib. 9, cap. 17, and the Malva 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 ovate 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. euphrasia of Fries, the dyspepsia of Dioscorides, loc. cit., and the Malva sylvestris of Pliny, loc. cit.

M. borealis has its outer sepals linear, as long as the ovate acutelyglabrous but strongly ciliated inner ones, the petals as long as the calyx; the fruit pubescent, glabrate, renicate-surfus. It is the M. pusilla of Smith, the M. rotundifolia of Fries. It is found in Britain, near Hythe in Kent. There are many other species of Mallow.

Those are common in many parts of Britain, and the others are of little importance excepting as ornamental plants. Those best for cultivation for this purpose are M. Moschata, Morelia, alias, Moreuma, and purpurea. There are several species which are sometimes seen in Iceland spar, and cuttings of them will strike root freely if planted in light soil underneath a handglass. The greenhouse species may be propagated in the same manner. The hardy perennial kinds
should be plucked in the open border, and may be propagated either by seed or by dividing the roots. (Don. Gardenia'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 duties of the mandatory, were so many that the Romans excused the consideration for what he had undertaken to do, but from his leading the mandant to believe that he would perform it, and thus causing damage if he should neglect it. It is distinguished as an early method of payment for personal service, forming the service undertaken without authority from the person for whose behoof it is undertaken; and from Locostio-Conductio, where the service is remunerated. The characteristics of this mandate, in a special sense, are stated in Heineccius, Ad Inst., tit. 27, and by Galus, 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, or the solicitor conducting a 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 control of the agent, in the manner in which they are treated in England, are merely treated as simple mandates. The acceptor of a bill is held to be a mandatory of the drawer. (Mandragora, [AEtops, P. C.]

Manganese, according to Arsenio, exists only in mineral form. During the prevalence of pneumonia medicine, preparations of manganese, particularly the bixoxide, on account of the large quantity of oxygen it can yield, were much employed; but since the views of Beddoes and others, 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 the bones, and in some cases be deficient in these structures, and also that carbonate of manganese exists in some of the mineral springs of Carlsbad and Marienbad, and hydrochloric of manganese exists in the waters of Kreuzentnach. 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 medicines, the deleterious effects of some forms of manganese justify a notice of them in this place. The extensive employment of black oxide of manganese in the preparation of black card, as an artifice of the shoemaker, has of late years been followed by the use of an aqueous solution of paralytic which should be early noticed, insomuch as after it is thoroughly established it seems altogether incurable; and the only chance of escape is the complete abandoning of the occupation. It is supposed that the paralytic started by extremities, affecting the motor nerves only, for the sensibility is unalloyed. A staggering gait is the first symptom of its commencement. This is often perceived sooner by others than by the sufferer. No chole, nor constipation, such as attends the use of lead, is manifested. (See Dr. Cooper's paper in 'British Annales of Medicine.' i. p. 41.)

Bixoxide of manganese has been used internally in pills, and also as a gargoyle; externally as an ointment in some obstinate cutaneous affections. It does not appear entitled to much attention. Hydrochlorate, and still more sulphate of manganese, deserve attention as chologogue, emulsivum, and promotor of perspiration. The disagreeable taste and the power of disabling of soda or other alkali, and its carbonate, are incompatible with it, as decomposition occurs. Its power of augmenting the secretion of bile renders it a valuable agent along with mercury, or a substitute for it when mercury for some reason be not borne. It is useful in gout.

MANGLE. (Calceking, P. C. S.)

MANSOTANA. [Leyacbt, P. C. S.] MANNING, ROBERT, is more usually called Robert de Brunne. He owes this name to his having been a Gillermine canon in the monastery of Brunne or Brown in Lincolnshire. 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 'Brut d'Angleterre' and 'Roman de Roi' of Wace and Galmar, begins with Æneas and ends with Cadwallader; the second, from Cadwallader to Edward I., is translated from the Chronicle of Peter of Auvergne, the first part of which 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 manuscript of French language, and valuable for its information, both historical and literary. Robert made in English rhymes a translation, which has 'ever been printed, of Saint Bonaventura's treatise 'De Cena et Passione Domini.' He translated also, freely, into octosyllabic verse, 'Manuel Focha,' or 'Manual of Sins,' which used to be attributed to Bishop Grosheath on insufficient grounds. Of this unprinted translation specimen are given in Warton's work and elsewhere. Hearne has supposed, with little reason, that Robert de Brunne was the author of the old English metrical romance called 'Ryeberde Cuer-de-Lyoon.'

MANTUA, the common name of a family of artists of Mantua, of the sixteenth century. The progenitors appears to have been Ghis, but few particulars regarding the lives of its members are known.

GIORGIO GRIM, called Giorgio Mantuno, was born in Mantua about 1520. He was painter, sculptor, engraver, and architect, and author of a commentary on Vitruvius—'Gli occuri e difficili Passi dell' Opera di Vitruvio.' ft., Mantua, 1558. He was born in Mantua, to which city he returned the works of the sixteenth century; they are well drawn and executed with great mastery, much in the style of Mantuanism. 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.

Bartsch describes 129 prints by ADAMO GRIM, called also Mantuno; and 46 by DIAZ GRIH, called also DIAZ GRIM. The years of the former are dated from 1568 to 1576, and those of Diana from 1578 to 1588. Diana was the daughter of Giovanni Battista Mantuno, and was married to Francesco de Bellotto, and settled in a fine house in a fine spot near Mantua, where she was the subject of several etchings,

Diana, Notizie Istoriche degli Intaglatori; Bartsch, Feinr-Graver; Brulliot, Dictionnaire des Monogrammes, &c.,

MANUEL, NICOLAS, sometimes called Deutsch, a celebrated Swiss painter, was born at Bern, in 1484. He is the Emmanuel Tedesco who studied under Titian at Venice about 1511, and he became very celebrated for a series of pictures (probably in disembrett) of the Dance of Death, Todesmitten, painted between 1514 and 1522, in the cloister of the Dominican convent at Bern. The picture consisted of forty-six subjects, forty-one of which were the actual Todesmitten; 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 1800. Manuel was an active reformer, and many of his designs are reflections upon the scene of the Reform, which he considered as the work of God. This is the result of his great political; from 1523 he took an active part in an official capacity in the government of Bern. He died in 1580. His own portrait, and several drawings are in the library of Bern. There are a few copies of his oil color, at Basel and at Bern.

Of Nicolas Manuel, until recently, little was known beyond what has been told us by his pupil, Johann Herbst. 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. Grineen, which is to be published at the University of Leiden, and will be a valuable contribution to the study of Malers, Dichters, Kriegers, Staatsmanns, and Reformators, Stuttgart und Tübingen, 1821.

(Magner, Neues Allgemeines Künstler-Lexikon.)

MANTUA, [Mivius, P. C. G. C., C. S. B.]

MARCELLUS, ULPNIUS, a Roman jurist, who lived under Antoninus Pius and his successor. He was employed by Pius as one of his legal advisers (Capitulina, Anton., 152), and his influence was considerable. He was succeeded by Aurelius, the successor of Pius (Dig. 28, tit. 4, 3), for Marcellus speaks of the proceedings in a case before Aurelius, a.d. 166, in which the emperor delivered judgment. Marcellus (Dig. 26, tit. 2, s. 13), as quoted by Ulpianus, cites an oratio of the Divi Fortunus, proving that he survived Aurelius, if the word Divi was used, and is not introduced by Ulpianus. It is conjectured that this is the third of the Marcelli who are cited in Book X of the Commentaries of Commodus, the successor of Aurelius, and by his military success excited the jealousy of the emperor. (Dion Cassius, liv. 8.) But it is doubtful if this Ulpianus Marcellus is the jurist. (See the note of Reinaud on Dion Cassius.)

The writings of Marcellus mentioned in the Florentine Index are thirty-one books of Digests, six books on the Leges Juliae et Papiae, and two books of Responsa. There are 169 excerpts from Marcellus in the Digest; and other works of his are cited besides those just enumerated. Marcellus is quoted by Marcellinus, Ulpianus, and Paula frequently, and by other jurists.

MARCH, a market and post town in the chapselsy of March in the parish of Doddington, in the northern division of Wiltshire hundred in the Isle of Ely, Cambridgeshire, 9 miles to the east by north, and 7 miles 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 38,240 statute acres, that of the chapelry of March 20,440 acres; the population of the parish in 1841 was 8,945, of whom 5,006 were in the chapelry of March. The population of the chapelry at the former enumeration was, in 1801, 1811, 1821, 1831, 1841, 5,117. The number of houses in the chapelry in 1831 was 1,016, inhabited by 1,029 families; 42 uninhabited and 16 buildings; in 1841 it was 1,163 inhabited, 32 uninhabited, and 12 building. In these returns the town is not distinguished from the rural districts of the chapelry.

The town consists principally of two streets, in the form of the letter T; the street which forms the stem 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 Nene, 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 a little distance from the town: the church, or rather chapel, stands at the southern extremity of the town: it is dedicated according to some statements to St. Mary, according to others to St. Wundreda, and is said to have been erected in the æra of the Christian纪元. The church is a small and commodious town-hall, where meetings are held. The town is within the jurisdiction of a Court of Requests established at Ely for the recovery of debts due 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 Nene, which is navigable.

The chapelry of March is united with the vicarage of Doddington; the clear yearly value of the united benefices is 732s., with a glebe-house; they are in the rural deanery, archdeaconry, and diocese of Ely. There were in the chapelry in 1833 nine day-schools, with 522 children of both sexes, giving not one in nine of the population (according to the census of 1841) 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 Dissenters, with 170 children.

Margravine Charlotte, Countess of St. Anselm (Government Gazette; Parliamentary Papers; Lyons' Magna Britannia.)

MARCIANUS AELIUS, a Roman jurist, who was writing after Marcellus Severus, for he calls him Divi (Dig. 50, tit. 4, s. 7). He was the son of the successor of Severus, for he names him Divus (Cod. 9, tit. 8, s. 8). He probably wrote chiefly under the reigns of Septimius and his son Caracalla. The works of Marcius, which are mentioned in the Floriculite Index are sixteen books of Institutiones, four books entitled Regularia, two books on Appellations, two books on Publica Judicia, a single book of Deletories, a single book on the Hypodecatoria (formula) and a single book Ad Sinum Institutiones. Marcius is cited by Ulpianus and Paula (Cod. 7, tit. 7).

There are 275 excerpts from Marcius in the Digest. (MARCH, p. 251.) MARGRIOTONE 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.

Margrion was a painter of the Government school, and of great reputation in his day. He executed many works in Arezzo, both in tempera and in fresco; in the latter style he painted the whole interior of the church of San Gianito. He was the author of a treatise on the history of his native city, of which the survivor is a work entitled "The History of Arezzo," in nine books. The frontispiece of the work is very ornamental, and it is said to have been the occasion of the destruction by the duke Cosmo de' Medici in 1517, to make room for improvement in the fortifications of Arezzo. Most of Margrion's works have now perished; but one, which according to the same writer, was his masterpiece, namely, San Francesco, painted for a convent in Sargiano, still exists, and is engraved in Lasati's "Eturia Antiqua," 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, Margrion much surpassed his larger works; but this picture has also perished.

There is still an old painted wooden crucifix by Margrion in the church of Santa Croce at Florence, where it is placed by the side of a similar work by Cimabue. Margrion's fame was very great in his time, but it was almost wholly eclipsed by the reputation of Cimabue and Giotto. He had a peculiar way of stretching and painting his canvases; they were primed with plaster mixed with size or glue made of strips of parchment, and were stretched and fastened with the same glue that was used for priming. In sculpture, as in painting, Margrion was more successful than in painting. There is still but a few, in the cathedral of Arezzo, a receding marble statue of Gregory X. over the tomb of that pope, which was also constructed by Mar- grion; and a powerful and richly colored painting, but this has been defaced by time: this monument, according to Vasari, is Margrion's masterpiece. As an architect, Margrion conducted the building of the cathedral of Arezzo, some time after the death of a very
Lafo, but according to the design of that architect, from about 1277 until 1289, when a war broke out between Aragon and Florence. He died at Aragon shortly after 1289, aged seventy-seven, and was buried in the old cathedral of that place, where his portrait was painted by Spinello Aretino, and the following epitaph was inscribed upon his tomb:

The less the better picture Marquess's,  
Cur requisit Dominicus terminalis altus plus.

(Vasari, Vite de' Pitori, &c., and the Notes to the German translation by Schorn)

MARINERS' CONTRACT. [SHIPS, P. C.]

MARIUS TYRILLUS. [PLEOEMANS, CLAUDIUS, P. C., p. 104.]

ARMON, SHAVERLEY, the son of a Northamptonshire squire, was born in that county, became a gentleman commoner of Oxford in 1617, and proceeded master of arts in 1624. He squandered a good fortune; took military service in the Low Countries; and in 1633 became one of the officers in the troop raised by Sir John Suckling for the king in his expedition against the Scots. But, becoming sick at York, he returned to London, and died there before the end of the year. Besides small scattered poems, he wrote three plays: 1: 'Holland's Leaguer, an excellent comedy,' 1632, 2v. 2: 'A Fine Companion,' a comedy, 1632, 4to.; 3: 'The Antiquary,' a comedy, 1641, 4to., a drama of considerable merit, which is reprinted in the tenth volume of Daveney's Collection.

MARQUIS'S RULERS. Among the methods which have been devised for facilitating the operation of drawing parallel lines, there is that by which consist in making one ruler slide along the edge of another in almost every case the most expeditious and accurate.

A triangular ruler having two of its edges at right angles to one another, having its side with one of its edges perpendicular to the length of a common rectangular ruler constitutes, apparently, one of the first contrivances of this nature. It is said to have been originally employed in Germany, from whom its use extended to other parts of Europe.

A triangular ruler of the form just mentioned is called by the French artists an équerre.

The most approved construction and application of a triangular ruler are due to an artist named Marquis, who resided in London, and by his name only the instrument is now known.

Where many lines are to be drawn parallel and perpendicular to one another, as in making plans or elevations of buildings, or the horizontal projections of the ramparts of fortresses, such an instrument is particularly useful. The right-angled triangle, as well as the rectangular rulers which accompany it, is made of box-wood, ivory, or some metal; and the scale on the sides of such rulers are certain scales with graduations in equal parts.

The ratio of the hypotenuse to the shorter side of the triangular ruler is usually as three to one; and on one of the surfaces of it, which is used to draw on the scale, the triangles which are drawn are short line which serves as an index. The rectangular rulers which are used with the triangle are each about 12 inches long; they have scales on both surfaces, and the graduations are cut close to the edges in order that the coincidence of the index on the triangle with any required division may be accurately made.

Parallel to each scale there is generally cut another, each of its divisions having the same proportion to each division on the corresponding scale at the edge as the shortest side of the triangle has to the hypotenuse (1 to 3 usually). This second scale is used entirely as a plotting scale for the purpose of laying on paper lines of given lengths in feet, yards, or other measure, or of measuring them when traced; the former scale being intended wholly for the peculiar purpose of the sliding triangle.

The plotting, or, as they are called, the natural scales, are of various kinds, but usually from 20 parts to 60 parts in an inch; the others, which are called artificial scales, vary consequently from divisions equal to \( \frac{1}{4} \) to such as are \( \frac{1}{8} \) or \( \frac{1}{16} \) of an inch.

When it is required to draw lines parallel to others at any given distance on a scale representing feet (for example), the apparatus is used in the following manner. Let \( MP \) be a rectangular ruler on the edge \( MN \) of which is the scale to be used: if, for example, the drawing is to be made on a scale of 30 feet to an inch, the scale is that whose divisions are each equal to \( \frac{1}{30} \) of an inch; then, the edge \( AC \) of the triangle being made to coincide with a given line, the index \( a \) must first, in a movement of the ruler \( MN \), 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 \( MN \) 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 given line and that which is to be drawn.

If the triangle is in the position of \( M'C' \), the position of \( A'C' \), along its edge \( A'C' \) will be the line required; for it will be parallel to \( A \) at a distance from it equal to the given number on the natural scale. The reason is manifest; for imagine \( A'D \) to be drawn parallel to \( BC \), then the triangle \( A'D \) is similar to \( ABC \); consequently, since \( A'E \) is equal to the distance \( a' \) between the two positions of the index, \( A'D \) will be the same part of \( A' \) or \( a' \) as \( BC \) is of \( A'D \).

That is, by the construction of the triangle, \( A \), the intersect between the parallel lines is one-third of the distance \( a \) on the scale, or equal to the corresponding distance on the natural scale.

Lines may be drawn parallel to one another by means of the side \( BC \) of the triangle; and it is evident that the distance between them \( (BC) \) for example will bear the same ratio to one another as the line \( AB \) or \( a' \), born to \( A \); that is, \( \frac{1}{3} \) to \( 3 \). But the edge \( BC \) is principally used in drawing lines perpendicular to given lines; if, for example, the edge \( BC \) were in coincidence with a given line, and it were required to draw, through a given point \( G \), a line perpendicular to such line, the triangle must be moved along \( MN \) till \( AC \) 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 \( BC \) is made to coincide with an edge \( MN \) of the rectangular ruler; and both ruler and triangle being moved together till \( AC \), then perpendicular to \( MN \), coincides with the given line, the triangle is moved along \( MN \) till the same edge \( AC \) is at the required distance from the original line; when the line may be drawn.

Marquis's rulers have occasionally been formed and used in a different manner. Instead of a single scale on the ruler \( MN \) 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, if a scale of divisions be required to coincide with a line at an edge of \( MP \), and if a right-angled triangle in which the hypotenuse is twice the length of one of the sides be used with it; on sliding the index of the triangle over each division, the edge \( BC \) is moved to the distance \( \frac{1}{2} \) of an inch: if the hypotenuse be four times the length of the shortest side, lines drawn contiguously to the longer side will, on sliding the index over one division of the scale, be equal to \( \frac{1}{2} \) of an inch; and so on.

MAROCO. [ARIOLES, P. C. S., p. 83.]

MARSH-MALLOW. [ALTHREA, P. C.]

MARSHALL, JOHN, Chief Justice of the United States of North America, was born in Fauquier County, Virginia, September 24, 1756. He was the son of Colonel Thomas Marshall, and the eldest of fifteen children. He received a little instruction at home, but was taught at an early age the rudiments of a regular course of education, and was never at any college. On the breaking out of the American war, he engaged with enthusiasm in the cause of his country. In 1776 he was appointed a first lieutenant, and in 1777 was promoted to the rank of captain. He was present at the battles of Brandywine, Germantown, and Monmouth. There was however a redundancy of officers in the Virginia army, and Marshall having applied himself to the study of law, was admitted to the bar in 1780, and in 1781 resigned his commission in the army.

Thenceforward he devoted himself to the law, and rose rapidly to great distinction in the profession.

Marshall was a member of the Virginia convention for the ratification of the constitution of the United States, and both then as well as subsequently in the Virginia legislature distinguished himself by his judgment and eloquence. He was twice offered the situation of attorney-general, and declined.
both occasions declined on private grounds to accept the offer. In June, 1797, John Marshall, Charles Cotesworth Pinckney, and Edward Rutledge, jointly and which 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 8th of May, 1800, he was appointed Chief Justice by the President. In the same year he succeeded John Jay as chief justice of the United States, and from that time till his death continued to fill the office with increasing reputation for ability and integrity. He died July 6, 1835, at the age of eighty. He had resided for some time in Richmond, Virginia, in hope that by medical advice and change of scene his declining health might be improved. Three of his children were with him, but his eldest daughter, who was then residing at Baltimore, on his journey to attend his father's death-bed.

Jude 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 diffuse and undiscriminating in narrative, and heavy and unadapted in style. This criticism seems not to have influenced Marshall, for his 'Marshall in the West' was published in 1832, comprised two volumes, and greatly improved. The 'History of the American Colonies,' which in fact occupied the first volume of the original work, he had published in 1802.

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 senior, in a letter on the bench of the Supreme Court, wrote in 1828 an article in the 'North American Review,' vol. xvii., 'On the Public Services of Judge Marshall,' in which he says:—Splendid as has been the judicial career of this eminent man, it is perfectly impossible that the inestimable value of his intellect, or the unrivalled accuracy of his learning, should be duly estimated except by the profession of which he was so great an ornament.

Many of those exquisite judgments which have cost days and nights of the most elaborate study, and for power of thought, beauty of illustration, variety of learning, and elegant demonstration, 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 presided in our deliberations, and given to the result a cogency of reasoning, a depth of penetration, a grace of expression, and a power of imagination that have surprised all who have studied the cases in his opinion, and have been struck with the unexampled degree of analysis and comprehensiveness of conclusion, to which none others offer a parallel.'


MARSCHALL, JOSHUA, D.D. [SNERAMIRE MISION, P.C. S.]

MARTINO, [MEMMI D. MARTINO, SIMONE, P.C. S.]

MARY, [SINT, is 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 about 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 muriel cliffs, about 200 feet in height, with which the sea meets. The ridge 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 ground is covered with common grass and some shrubs, on the east side, or only the site, any land which is fit for cultivation. The cultivation is limited to wheat, Indian corn, potatoes, and beans and peas. There are few plantations of trees, but those of oranges have been lately 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, except that there is much less rain than in that of St. Michael's.

The population, according to the census of 1840, was composed of 4686 individuals, of whom about one-half belonged to the small town of Villa do Porto and two hamlets; the remainder were dispersed in different parts of the island. There were then 2913 males and 2473 females. There are some public schools, established by government, but in 1840 they were only attended by fifty-two pupils, all males. The

The whole quantity of agricultural produce is comprised in 2500 quarters of wheat, 2450 quarters of barley, 200 boxes of honey, 100 boxes of sugar, a small quantity of white beans, peas, and other articles. About one-half of the wheat and all the oranges are exported to St. Michael's. This produce is derived from one-sixth of the landings, and to a smaller extent from the remainder.

St. Mary in Azores was discovered in 1481 by Goncalo Velho Cabral, a Portuguese, who was sent by the Prince Don Henrico to explore the part of the sea in the Azores are situated, and the island received from him the name of San Miguel, as he discovered it in 15th of August, the festival of the Assumption of the Virgin Mary. Soon afterwards it was settled by Don Goncalo.

(Munt. Description of the Island of St. Mary, in London Geog. Journal, vol. xiv.; Bird, Description of the Azores or Western Islands.)

MARY, DUCHESS OF WÜRTTEMBERG, or the Princess Marie d'Orleans, was born in April, 1815, during the exile of her father Louis-Philippe, then Duke of Orleans, and residing at Palermo with his wife Amelia, second daughter of King Ferdinand of Naples. The Princess Marie spent much of her childhood at Twickenham, near London; her youth was passed under the care of her mother at Nevers, until her father was raised in 1830 to the dignity of King of the French. From her childhood a devoted love for art had been a distinctive feature of her character, and as soon as she was at an age to benefit by it, the infant Marie-Philipphe commandd some of the most skilful artists in their several styles to attend upon her. Ayi Scheffer was her master in design and painting, Pierre Jean David instructed her in modeling, and the famous sculptor Bertin taught her drawing in water-colours. She was married to the Duke of Württemberg in 1837, and she died at Pisa, in January, 1839, in consequence of injuries suffered from the congestive failure of her lungs at Stuttgart.

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 noble 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 after she had 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 deplored the untimely fate of this accomplished princess.

MARYGOLD. [CAZEROLLA, P.C. S.]

MASCARA. [ALDERS, P. C. P. 330]

MASCIA CALANDRA. [FLORENZO], 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 unwarried diligence. After ten years he was solicited by the government 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 Abbe.

He 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 study, that he was assigned 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 Cispinese 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 performance of experiments with a 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 4to. a work entitled "Sulle Curve che servono a delineare le Ore Ineguali Antichi nelle superficie Plane," Bergamo, 1784; and in the following year, at the same place, a tract, also in Italian, on the Equilibrium of Volumes, 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. In the year 1788 he published "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 the employment of straight lines.

He also published a "Trattato della Inversione," in which he has confided his method of the inversion of the branch of a curve in which it is required to find between or beyond two given points, and in the direction of a straight line joining them, other points whose distances from the former are in any assigned proportions; these are given in the work methods of 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, and this, or one of those points, from the other, and of inscribing polygons in circles. There are also approximative 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 cosine 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 Giannoni, an elegy on the death of Borda, and a poem entitled "Invito di Daino a Lechia," in which he introduced a precise description of the objects contained in the museums of Paris; and philosophy at the same time.

He died in July, 1809; in consequence, it is said, of too close application to his scientific studies, leaving several manuscripts, and among them one on "Pyramidometry," a subject which he much esteemed. He had previously investigated, but which Mascheroni had not noticed, a branch of the subject on the application of geometrical curves to the calculation of the volume of bodies, and the surfaces which envelop them.

(Biographie Universelle; Montucla. Hist. des Mathematiques.)

MasSENA, ANDRE, Prince de Eslng, Duke of Rivoli, and Marshal of France, was born at Nice, 6th May, 1758. 'Several of the French marshals," says D'Irakilly, 'and the most famous—Massena, for example—was Hebrew; his real name was Massenais ("Connoisez," l. 200). 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 captain of a trading vessel, but having taken a dislike to a sea-faring life, he abandoned it, and in 1777 he was appointed to 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 obtained the rank of sergeant, which, when he afterwards became a colonel, he described as the step in his military career which had cost him the most to gain. Dis- couraged by this slow promotion, he retired to his native city, where he made an advantageous marriage. Events connected with the French Revolution, he deposits at this period, and he was appointed by the sufferings of his fellow-soldiers to the rank of adjutant-major of the battalion raised in the department of the Var, of which regiment he subse- quently became colonel. He was made a member of the general of brigade, and general of division a few months after.

In the Italian campaigns of 1794 and 1795 he served under the generals Kollermann and Scherér, and it was chiefly owing to his skill as a tactician that the victory was gained in the battle of Saorgio (August, 1794), and on the Col de San Giovanni in 1796. Indeed the greatest part of the success that has generally been attributed to the ability of the plans which the influence of whose military conceptions he so justly appreciated, that he summed up the "favourite child of victory." The scenes of his principal exploits were Montemonti (8-11 April, 1798), Millesimo (14 April, Castiglione (39 June—3 July), Arcola (15-17 Nov.), and Rivoli (9 January, 1797). At the peace of Campo Formio, October 17, 1797, Massena was sent to France to present to theDirectory the following three proposition of the handful of Austria. In February, 1798, he was appointed to the command of the army which, under General Berthier, was occupying Rome and the Papal States. His appointment to this office was equally disliked both by the French soldiers and the inhabitants of the said 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 a "Memoire" in justification of his conduct, notwithstanding which he was left without employment till 1799, when the important duties of the head of the Bureau of War were assigned to him. In the direction of this campaign he evinced a military talent of the highest order. The memorable battle of Zurich (5th and 6th of June, 1799), in which he obtained his triumph over the Russians and Poles, saved France from the invasion of the allied powers, and led to the dissolution of the coalition which had been formed between the Russians and Austrians.

On the return of Joseph from Egypt, Massena was employed by him to defend Genoa, which was at that time invested by a large Austrian army, and closely blockaded by the English fleet under Lord Keith. He arrived there on the 18th of February, 1800, and defended it against the superior forces, and amidst the horrors of famine, till the 3rd of June, when, unable to prevent the rising of the inhabitants, he was compelled to agree to an honourable capitulation. Only eleven days after this capitulation, Bonaparte, conqueror at Marengo, stipulated the evacuation of this city, which was again re-entered by the French under General Suchet, on the 24th of June, 1800. (Genoa, P. C.)

Massena's name does not appear connected with any event of importance till May, 1804, when, on the same day that Napoleon became emperor, Massena was created a marshal of France. In 1805 he was again appointed to the command of the army in Italy, where he was only tied to the line of the Po by 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 grand army of Bonaparte (June 1805). After the peace of Preising (20th Dec., 1805), Massena had the honour of being one of those who 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 reduction of the fortress of Gaeta (18th July, 1806), 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 commemoration of the skill and bravery which he had displayed in a most brilliant campaign, against the grand army of the Emperor (1807). P. C. S.: 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. A party who had espoused 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 accidentally struck it.

The Austrian campaign of 1809 was not attended with considerable lustre on the already high military character of Massena. He greatly distinguished himself at Landshut and Eckmühl. The rapid capture by storm of the strong castle of Eierendorf, which, from its position, was considered as impregnable, especially attracted the admiration of Napoleon. At the battle of Asling (Lannes, P. C. S.) the defence of the village of Aspern was confided to Massena, and it is gene-
Finally believed that to his obdurate resistance in that village the French army was indebted for its preservation. His eminent services on that most critical occasion were rewarded by the rank and title of Prince of Essling.

The same success attended the operations of Massena at Parnawa. At the destruction of Wagram he was obliged to direct the movements of the left wing of the army while seated in a carriage, on account of an injury produced by a fall from horseback. An incident there occurred which showed that in more than one respect he was "the favored child of fortune;" at one time success appeared doubtful, and to animate his soldiers he was enabled to place on horseback; he had scarcely been so when a cannon-ball struck the very post on which the carriage had not been secured, and he had occurred.

In 1810 Marshal Massena was appointed to the chief command of the army in Portugal, which was about seventy-two thousand strong: his commission was to drive the British, under Wellington, from Portugal. His exploits in this campaign, though in many instances marked by great military talent, have not added to his reputation as a general, while the frequent examples of his cruelty, avarice, and breach of faith, recorded in the histories of that period, have left a deep stain upon his memory. One achievement, however—his masterly retreat into Spain after the failure of his attempts on the lines of Torres Vedras—has been the subject of the highest admiration, as far as even a military defeat can be considered, by both English and French historians. (Sir W. Scott, Life of Napoleon, vol. vii. p. 156.)

Massena was recalled from Spain in 1812, and the command of which he left was bestowed upon Marshal Marmont. His health having severely failed, he was unable to join the expedition to Russia. In the latter end of 1813 he was sent to Toulon to take the command of the eighth military division, from which place he formally declined his adhesion to the Bourbons, on the 6th of April, 1814, and was by them confirmed in his command. On the return of Napoleon from Elba, after some hesitation, he recognized his government, but kept aloof from all active participation in the events which took place during the Hundred Days. After Napoleon's second abdication he was appointed commander-in-chief of the national guard of Paris. Being chosen a member of the Council of War which was assembled for the trial of Marshal Ney, he at first declined sitting as a judge on a fellow-soldier with whom he had been for some time at variance, and when this objection was overruled he joined the majority of members in pronouncing for the incompetency of the court. (Ney, P. C. S.) Some months after these events he was denounced in the Chamber of Deputies on the charge of having been at the head of a conspiracy for the return of Napoleon, and having procured, and been satisfied with, the order afterwards publicly recelled the accusations which had been brought against him, in a "Memoire Justificatif," to which a reply was published in a pamphlet entitled "A Letter of a Citizen to Marshal Massena," which was written by a man 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 Paris, the 11th of April, 1817. His will, which was pronounced by General Thiibault, was inserted in the "Mercure," and afterwards published separately.

Massena was gifted by nature with a powerful frame of body and with indomitable resolution. His bravery was rather characterised by perseverance than by impetuosity. 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 orders and for his penetrating insight into the intended movements of the enemy. He had moreover the invaluable quality in a commander of not being dispirited by defeat. 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. (Allson, vol. iii. 4; Las Cases, Memoires de St. Hilaire; Court and Camp of Napoleon; Hist. des Batailles et Biographie Moderne; Palet, Memoires sur la Campagne de 1809, Paris, 1823-24, 4 vols. (This accurate military writer was aide-de-camp to Massena); Napier, Hist. of the Peninsular War.)

MASSON, ANTOINE. This celebrated French engraver and painter was born at Louy, near Orleans, in 1636, and was originally an armurier and damasquinier, damask-worker, and goldsmith, and an artist in much request in the days of armour and chivalry. Masson, 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 character of his plate was seen at the time of his death, and his engraved portraits, has been condemned by some critics as mere bravura 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 those fine lines, and in draperies and animals he has given evidence that this peculiarity is not 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 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 Wattelet, to be made entirely of straw; yet notwithstanding these peculiarities, says the same intelligent critic, this print is the best engraving after Titian. Wattelet says that Masson'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 a few lines, it was done at the prayer of the praying disciple is the Pope Adrian IV, the other is the Emperor Charles V., the host is the emperor's confessor, and the attendant is Philip II. of Spain. Masson died at Paris, in 1699, and was a member of the French Academy of Painting. He has executed many portraits, several after his own paintings, and some of them are nearly of the size of life. Masson'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. (Wattelet and Leroquc, Dictionnaire des Bonnes Arts; Robert Dumenil, Peintre-Graveur ; Nagler, Neues Allgemeines Künstler- Lexicon.)
Mahomedanism, Christianity, those of Zoroaster and Confucius, and the idolatry of barbarous nations. His geographical knowledge was no less extensive and correct than his acquaintance with history, and no Arabic writer can boast like him of learning at once profound and almost unlimited. In the introduction to Dr. Spranger's treatise 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, and the freedom from opinions, without want of firmness and principles; the thirst for correctness of information without preconceived erudition, the admiration for the works of men, who were entitled to succeed Mohammed as Khalif; 7 'Kitab al-means,' the 'Book of Questions on the Causes of Religious Opinion.'

Asiatic, or the full import of the terms, which are used by the 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 respect the Arab has a singular advantage over the Persian, and delight of the learned in the East, was too voluminous to meet with popularity. According to Burchardt there is a MS. of it in the library of the mosque of St. Sophia, which, incomplete as it is, consists of twenty large volumes in 4to., and ten at least are said to be wanted to make it complete. The 'Akhbâr ez-ze'mân' was a general history of all nations; it has never been printed; MSS. are very rare in the East, and there are none in Europe. In the royal library in Paris however there is a MS. fragment of it on Egypt, of which there is a MS. translation by Pêris de la Croix, which has been preserved by later orientalists. The Arab Hezârâmân, by Dr. Tübingen, the 'Ibarat al-Akkâmâr,' the 'Ibarat al-Ma'tâm,' or the Book of Pearls gathered from the History of the Times,' of which there is a MS. copy in the Royal Library at Copenhagen, and another in that of Paris, is an extract from a work of the same name, preserved by the orientalist Rasmussen. Saint Simon however doubts this. This extract was made in the 9th century of our era, by Shehab-ed-din Ahmad-an-Mokri, a native of Fes in Morocco. 2 'Kitab al-advis,' 'The Book of the Middle,' the word 'advis' the plural of 'waiz,' being probably taken in the sense of 'proprietor,' 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 other Arabic writers. Aware that his works were too voluminous, Mas'udi wrote, 3 'Moruj-al-dheeb我们会 al-mudalib,' which he celebrated as Meadows of Gold and Mines of Gems. This is an extract with additions from No. 1 and 2. In the Leyden MS. preserved 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 nothing but the history of his time, whatever may be the date of the work, according to the author, for each chapter bears the date when the author finished it. This seems, however, scarcely credible. In A.H. 345 the author issued a second edition consisting of 7 volumes, but all were destroyed, and the work was again commenced, 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-Shaffi, a native of Nata, made an extract from the 'Golden Meadows,' and so did Reiske during his residence at Leyden. The 'Historia Hoc in 'Compendiosa Antiquitates Historiarum,' is a translation of a chapter of the 'Golden Meadows;' and it appears that the Arabic treatment of which Renaudot published a translation under the title 'Ancienne Relations des Indes et de la Chine de deux Voyageurs Mohammedans' is likewise a fragment of the work. It is probably of the second edition. Dr. Gildemeister published a translation of a chapter of it on India, entitled 'De Indis, in the 'Journal et Monumenta Asiae,' 1850, 8vo. He attempted to publish a 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 polities 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:

1. 'Kitab fonun-al-m'drîf,' etc., 'Different Branches of Science, and of what has happened in bygone times; 5 'Kitab dekhâr-al-'ulûm,' etc., 'Treasury of Science,' etc.; 6 'Kitab al-fawziâr,' etc., a series of 10 books, embracing the highest importance to all Mohammedans, namely on those who were entitled to succeed Mohammed as Khalif; 7 'Kitab al-means,' the 'Book of Questions on the Causes of Religious Opinion.'

On Extravagant Opinions.' It is much to be regretted that there is no critical edition of this work; 12 'Kitab al-wâlî-nanîs,' 'The Physician of the Soul,' with a metaphysical digression on dreams; 13 'Hadîth al-dehâr,' 'Buds of Flowers,' contains historical information on the descendants of Mohammed and their virtues; 14 'Al-mas'udi we al-tarnîk,' 'On Principles and Compositions,' treats among other subjects of the influence of the sun and the moon; 15 'Kitab al-sirius as-sirîyân min al-sirîs al-molukîh,' 'The Book on the Seventy Chapters,' treats on the policy of kings, and is a very remarkable work.

We close this list with, 16 'An Account of the Establishment of the Fatemite Dynasty in Africa, from a MS. called to Mas'udi,' with notes, by John Nicholson, of the British Museum, at Saxe Cobourg, and Silvestre de Sacy, this work is a fragment either of No. 1 or No. 2 in our list. The MS. used by Dr. Nicholson is one of those which the unfortunate Dr. Secten purchased at Damascus, from the Mahomedan emir, of the reigning house of Saxe-Coburg, at Gotha; it was written in A.H. 627, and is consequently of more modern date. An orientalist well acquainted with the works of Mas'udi would confer a great benefit on geographers by writing a commentary on the geographical system of the author. Mas'udi had thoroughly studied the systems of Ptolemy and Marinus of Tyre, and he distinguishes between the maps of Ptolemy and those of the Syrian geographer. There is consequently no doubt that the geography of Marinus was extant in the 10th century of our era. Mas'udi speaks of the Arabic origin of the kings of Tibet, a fact which is likewise mentioned in the Chinese annals; of a Syrian empire anterior to that of Nineveh; of Wm in Armenia as the city of Semiramis; of cuneiform inscriptions, and other matters. And since the Arabic poem of which the Rev. Charles Forster has availed himself for deciphering the Hymylite inscription in the Holy Quran, Ghorsh and others, was taken from Schultens 'History of the Christians' mentioned above, it seems that there is no small chance of finding a clue to the Hymylite characters in the works of Mas'udi.'
MAT,CII, in Gunner'y, is a material employed in firing military mines or in discharging pieces of ordnance. Before the invention of the inro-lock, hand-guns or small arms were fired by matches, which the soldiers carried with them on service; and in such-lock fire-arms still used in war are the primitive Dunne's, 3, cap. 135; and of Plutarch (Sulla, cap. 13). Other plants, as species of Parietaria, Chrysosplenium, &c., were called 'wasp-wood' or the Green Manure, (hibiscus, Manual of British Botany; Fras, Synopsis Flora Plant. Classic.)

MAURICE, THE REV. THOMAS, was born about 1755, and, even his father, was then the Rector of 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, on opening his school at St. Aunck, prevailed on to receive 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 Jesus College. After taking his 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 greater leisure for study. Next year his health gave way, but his life lived for more than four years. He had already written a translation of the 'Edipus Tyrannus,' and several other volumes of poems; and he long continued to publish volumes of verses. He was afterwards made Professor of Mathematics at 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 purpose the proposals in 1777 were addressed to the East India Directors. The religious spirit of the French revolution, alarming Mr. Maurice's mind, induced him to remodel his first work after it was nearly completed, and to add a considerable number of notes to it. These investigations 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 owing to the liberality of the Earl of Harborough, and the seventeenth and the eighteenth, in 1797. Meantime he had undertaken his 'History of Hindostan,' the three volumes of which, in quarto, were published in 1785, 1786, 1798; 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 pension that had been held by the poet Cowper: and in 1804 he received from the Lord Chancellor the vicarage of Cudham in Kent. His 'Modern History of Hindostan,' in two volumes, appeared in 1802 and 1803. In 1804 he published several other volumes of verses, and was one of the last undertakings was his 'Memoirs: comprehending the History of the Progress of Indian Literature, and Anecdotes of Literary Characters in Britain, during a period of thirty years.' Of this work he completed the first two volumes in 1820, and 1822. Mr. Maurice died at his apartments in the British Museum, on the 30th of March, 1834.

MAURICIUS, JUNIUS, 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. 23); he was therefore a contemporary of Gaius. The only work of his that is mentioned in the Florentine Index is six books Ad Leges. There are four excerpts from Mauricius in the Digest.

MAURY, JEAN SIGFREID, Cardinal, was born on the 24th of June, 1640, at Avranches, in Normandy, to 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. Carde, at Avranches, to pursue 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 publications gave considerable notice. Encouraged by this early success he took orders, and devoted himself to the study of jurisprudence. In 1772 an 'Eloge' on Fénelon, which he published, was favourably received by the French Academy. The death of Charles Colin, the celebrated planter of Louisiana. He however soon returned to Paris, where he became very popular as a preacher. A panegyric of St. Louis, which he delivered before the French Academy, and of St. Augustine.
before an assembly of the clergy, met with so much success that the abbey of Freneade 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 celebrated Jacobin Club of Périgueux, and soon took a prominent part in the debates. From the first he extolled himself on the aristocratic side, where his eloquent oratory and peculiar talent at reply rendered him a formidable antagonist to Mme. Campan, the sculptor, who opposed admission which he advocated. In an oration, though it 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 for which he had advocated secured for him the respect and esteem of the more enlightened portion of his enemies. 'Opposed in debate by Mirabeau, Barnave, and Clermont-Tonnerre; interrupted at every step by the hisses 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, turned up to the lamp-post, or torn to pieces at the close of every interesting debate, by the furious mob which often surrounded the Assembly, he never deviated from his duty, but was over to be found at a post. A true soldier of the church, he threw himself with undaunted valor into the breach, and it was hard to say which his greatest enemy was. Whether it was his declamation, the cutting force of his sarcasm, or the inexhaustible resources of his knowledge, were most contemptible.' (Allison, History of Europe, vol. i. p. 389.) On the 27th of November, 1789, the National Assembly was summoned, probably, by which every ecclesiastic in the kingdom was required to attend an oath to maintain with all his power the new constitution; and, in case of any priest's refusal, it was declared that he should be held to be a rebel and deprived of his benefice. 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 great majority of the clergy. With the assurance of the pope and of the 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 exclamation, when the last efforts of his impetuous 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 Sir George Barrow, he sailed for England, where he was received with the highest distinction, and the loss of his benefits in France was more than compensated by his pecuniary elevation to the highest situations in the Roman church. In 1792 he was appointed by the Revolutionists, and afterwards appointed apostolical nuncio to the diet held at Frankfort for the election of the emperor of France II. This mission accomplished, in 1794 he was elevated to the dignity of a cardinal, and was instituted to the united sees of Monza, Fiesco, and Astino.

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 convention assembled for the election of Pius VII. In 1799 he returned to Rome upon the conquest of Italy by Suwarow, and was accredited as ambassador to his exiled king, Louis XVIII., who recognized the characters of the Bishop of Fontainebleau. This office he resigned on the reconciliation of the church of Rome with the government of France under Napoleon, on which occasion he addressed to the First Consul a letter, couched in such terms of the highest respect as to give permission to return to France. This letter, which was deemed not to be in union with the tenor of his former conduct, subjected him in after-times to the reproaches and persecutions of the fanatics, who so often surrounded the ambassadour. Napoleon gladly received the proposal of a reconciliation with so distinguished a member of the church whose establishment he was restoring in France: an interview took place between the two sovereigns, and in May 1801 the pope returned to Paris. The flattering reception he there met with was calculated to attach the interest of this chief, who admitted him to his intimacy, and availed 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 Jérôme Bonaparte. In 1807 he was elected a member of the Institute in the place of Target, one of the advocates of the cause of Napoleon. Archbishop of Paris, the unfortunate Louis XVIII. addressed to him the congratulations 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 exposed 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 sentiments. (His memoirs give a very full account 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 Jacobin regime, and by the witty frequenters 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 fortune they forgot his former daring and powerful support of their tottering throne. He then retired to Rome, where he was imprisoned during one year by the orders of the pope; he was afterwards allowed to live in semi-retirement; but his situation gave him no compensation for his resignation of the seclusion of Monte-Fiascone. In this retirement, deeply affected by the ingratitude of his former party and that of the pontiff, to whose elevation he had been instrumental, he died in 1816, aged 69 years, universally lamented as a man of talent rather than a man of sense, and a curate of the time of the League rather than an abbé of the reign of Louis XIV.

'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 abbé of the reign of Louis XIV.' She adds that his figure was in the highest degree contemptible, but that his diction she gives of it appears rather a caricature than a portrait.

His principal work, 'Essais sur l'Eloquence de la Chaire,' 3 vols. 8vo., published after his death by his nephew Louis Siffrein Maury, still maintains its well-earned popularity. His mind was formed to appreciate the eloquence of Masallion, Bossuet, and Bourdaloue, and his criticisms on the other French divines are in general as correct as they are temperate. 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, Sheslock, and John Gill; and it is evident that his method of criticism is founded on the comparison which he draws between him and Masallion is necessarily most unfavourable to the former. His own Panegyrics of St. Augustine is esteemed one of the finest of his productions; and in the exercise of this art conjunctly with the Abbé de Bismont, 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. xii.; Allison, Hist. of Europe, vol. i.; Mémoires de la Duchesse d'Abrantes; Biographie Universelle Classique, Duclasse Paris, 1829; Biographie Moderne, vol. ii.; and a curious work entitled Dictionnaire des Girouettes, Paris, 1815, in which are fully detailed the political variations of the most remarkable characters in the empire, though sometimes with more sarcasm than truth.)

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connected with the moving power and resistance are tangents to the circumferences are those at which the forces are conceived to be applied. Also, if several forces act at once as moving powers, and resistances to be overcome at once at various points, the resultant of all the forces of the 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 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, as is the case with those which are impelled by the 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 equation of the machine; for, $F'$ representing the moving power, and $V$ the velocity with which it moves, $f$ 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, it varies 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 initial 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 which the velocity $V$ being determined by the weight or resistance which is just sufficient to prevent the power from communicating motion to the machine, and $V$ by the velocity with which the machine can move when the resistance is zero),

$$ F' = F : V : (V' - V); $$

when $F = \frac{F'}{V} \cdot \frac{(V' - V)}{V}.$

Then the first member of the above equation $FV = fv$ becomes

$$ F' \cdot V - V'; $$

or, putting $v'$ for $V' - V$, which gives $V' = V + v'$, it becomes

$$ F' \left( \frac{v'}{V} \right)^2 = (V - v'). $$

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 efficient action of the machine, is to be a maximum; therefore, differentiating that expression, $v'$ being the variable, and making the result zero, we have

$$ 2V - 3v' = 0; $$

and, by 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 $\frac{4}{9} F' V'$ 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 $\frac{p \sin \theta - w \sin \theta'}{p + w}$ is the accelerating 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,

$$ v = \frac{p \sin \theta - w \sin \theta'}{p + w} \cdot t, $$

and consequently the momentum of $w$ varies with

$$ \frac{p \sin \theta - w \sin \theta'}{p + w} \cdot t. $$

This expression is to be a maximum; therefore, differentiating it, $w$ 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, $p = \frac{r}{r'}$ in the case of equilibrium; therefore, when the power is such as to produce motion, the motive force may be expressed by $p \cdot \frac{r}{r'} \cdot \frac{r}{r'}$, or if applied at the extremity of $r$. Now, in order to find the momentum of the 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 $p' r'$, we have $p' \frac{r}{r'} = w r'$: whence $p' = w \frac{r}{r'}$; the whole inertia to be overcome, if applied at a distance $r'$ from the fulcrum, will therefore be $p + w \frac{w r^2}{r}$, and the accelerating force at the extremity of $r$ will be

$$ \frac{p + w r^2}{r} = \frac{p' + w r^2}{r'} $$

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 $v$,

$$ v = \frac{p' + w r^2}{r'} + \frac{w r^2}{r} + \frac{w r^2}{r'}, $$

in order to obtain the velocity at the end of the arm $r$, the expression for $v$ must be introduced in the ratio of $r'$ to $r$; therefore the velocity at the latter extremity varies with

$$ \frac{p' + w r^2}{r'} + \frac{w r^2}{r'} + \frac{w r^2}{r}. $$

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 $r' \cdot r$, 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 Faelichian, or a commentary on the Lex Faelichiana. On (died 1326). There is one excerpt from Maximus in the Digest.

Q. CORNELIUS MAXIMUS, a contemporary of Cicero, was the master of C. Trebellius Tcesta, the friend of Cicero and Brutus. There are three fragments of his works: 1) letter to Brutus, 2) letter to Caesar, and 3) oration 48 (Dig. 38. 1. 16), which prefers his opinion to that of Servius on the use of adverbial sentences when conflated with the 'instrumentum,' the word 'instrumentum' comprised the rakes, spades, poles, and stakes.

MAY-FLY, the popular name of the Neuroptera insects of the genus Ephemeris and its allies. [Ephemeris, P.C.S.] Baetis (referred to Mayfly in P.C.S.) is one of the genera of Ephemerida. The Baetis venosa, an insect inhabiting a great part of Europe, is the type.

MAYER, SIMONE, a composer of great repute during the latter part of the last, and early in the present century, was born in Bavaria (at Sandersdorf, in 1760, according to Gerber; at Mendorf, in 1763, as stated by Lichtenhal). In 1778 he composed his 'Tres musicae'; in the same year 'La Ginerva di Socrate,' founded on the episode of Ariodante, in the 'Orlando Furioso,' which yet keeps possession of the Italian stage. In 1782 he died at his 'Kolhak,' [Avorno ed Asciola,' and 'La Rossa Bianca, e la Rossa Rossa,' a 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 operas, 'Medea,' first made known in London by Madame Pasta, whose personification of the Sorceress of Colchis was by all acknowledged to be one of the finest historical exercises 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 dramas on the foundation of the poet. The bold determination of Mayer (and also of Faer) to draw more effects from the orchestra—to give to his compositions a higher colouring, as well as deeper contrasts of light and shade—was, to say the least, a discovery—by no means at first with much opposition from the staidy non-progressive, 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 opposite; for the clamour of all kinds of braying instruments at present supplies the want of invention, may even of taste in plagiarism. Hence what Gretry un unjustly and expensively, if not justly, said half a century ago—that Mozart 'placed the statue of the poet, the pedestal on the stage'—may now with the strictest propriety be affirmed of the stage. In addition, that the statue exhibits nothing but distorted features and false proportions. Mayer died December 2nd, 1845.

MAYHEM. [MAXIMI, C. P. C.] MAYHEM. [MAXIMI, C. P. C.] NEVILLE, JAMES, 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 chaplain to the king, and lived in the royal household. He was created D.D. in 1646. Firmly devoted to the royal cause, he was deprived of his student's place and chapelries, and banished from the city. After a life of suffering, he was restored to his living; he then became chaplain in ordinary to the king, a canon of Christchurch, and archdeacon of Chichester. He died at Oxford, in 1672, and was buried in the aisle adjoining to the choir of Christchurch. His works consist 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 birth to two plays of his— 1. 'The City and the Country' 1658, folio; 1658, 4to.; 1659, 8vo.; and in the ninth volume of Dodalcy's 'Old Plays;' a work considerably more amusing than decorous, and especially lively in its satire on the Puritans; 2. 'The Amorous Warr, a tragi-comedy,' 1648, 4to.

MAZZOLINI, LODOVICO, a celebrated painter of Ferrara, sometimes called Lodovico Ferrarensis, 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 Lumazza to Partenio, as the diminutive of Mazzola, and Vasari has noticed him slightly under the name of Malini, whom, 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 is not 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 the most masterly manner of the Italian painters. His works are miniatures of pieces, and are excellent in colour, light and shade, and expression; and even in composition they are equal to the best works of their style, the symmetrical. They are still more remarkable to the small works by Gardadio. Mazzolino generally painted architectural backgrounds, and these are remarkable for the beautiful detail of the ornaments and figures in basso-reliev, which are introduced into them. He died at Ferrara in 1550.

The works of Mazzolino are not numerous. There are several in the Capitol and in the Dom Church of Ferrara, four in the Gallery of the library, which is a valuable large picture on wood, of Christ disputing with the Doctors; it is marked MDXXIV. Zesar Lodovicos Mazzolinos Ferraren- nas. 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 of the school of Mantegna. It is the case with a beautiful Nativity in the Florentine Gallery.

Lanzi, Storia Pictorica, &c. MECCA, the birth-place of Mohammed, and the holy city of the Moslems, stands in the situation of the land of Arabia which is called El Hedjaz 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 length, but the whole extent of ground comprehended under the designation 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, completely barren and destitute of shrubbery and wild vegetation. The rainfall is very small. 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 than the streets of Egypt or Persia. Many of these houses are three stories high. In most towns of the Levant the narrowness of the streets contributes to their coolness, and in countries where wheel-carriages are unknown it allows two loaded pack-horses to pass the town with sufficient ease. 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
square of the great mosque, which is only enclosed 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 during the time of the pilgrimage, the lowest class of hajji drink it. The famous well of Zemzem in the great mosque is indeed copious enough to supply the whole town, but the water is not well tasted. The water is brought upon an ass from the vicinity of Ar'afat, six or seven hours distant. This aqueduct is wholly built of stone, and all those parts of it which appear above ground are covered with a thick layer of stone and cement. There are two places in the interior of Mecca where the aqueduct runs above ground, and in these parts it 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-pots.

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 no longer inhabited. Except four or five houses belonging to the sheik, two mediresses, or colleges, and the mosque, Mecca has no public edifices, and in this respect it is perhaps more deficient than any other Eastern city of the same size. Burckhardt remarks that the want of splendid edifices is to be imputed to the veneration which the inhabitants entertain for their temple, and which prevents them from constructing any edifice that might possibly rival it.

The mosque, called Beitullah (God’s House), or El Ihsan, is only remarkable for the Kaaba, which it encloses; for there are several mosques in other places of the East nearly equal in size and superior in beauty. The Kaaba stands in an open space, 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 capitals or bases are exactly alike. The capitals are of coarse Saracen workmanship, and some, which had served for other buildings, have, by the ignorance of the workmen, been replaced by better ones.

Seven paved causeways lead from the colonnades towards the Kaaba, or Holy House, in the centre. The whole area of the mosque is upon a lower level than any of the streets surrounding it, and is a descent of about half a mile, 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 greatest size of little square blocks of different sizes, jointed together in a very rough manner and with bad cement. It stands upon a base two feet in height, which presents a sharp inclined plane. As the roof is flat, it has at a distance the appearance of a perfect cube. The only door leads into it 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 building is the famous Black Stone; it forms a part of the sharp angle of the building, and is four or five feet above the ground. It is an irregular oval, about seven inches in diameter, with an undulating surface, composed of small, perfect cubes, each one of a different size and shape, well joined together with a small quantity of cement and perfectly smooth. Every pilgrim kisses this stone. As its surface has been much worn by the kisses and reaches of the place, it is difficult to determine the nature of the stone. It appeared to Burckhardt 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 approaching to black. The four sides of the Kaaba are covered with a black silk stuff, hanging down to the roof bare. This covering is renewed annually at the time of the hadj, and is brought from Cairo, where it is made at the expense of the Turkish sultan. An opening is left for the black cloth which is supposed to be put on by the women after a period of fifteen days before the new one is put on. The black colour of the covering spread over a large cube in the midst of a vast space, gives to the Kaaba a singular and imposing appearance. As it is fastened slightly, the least breeze causes it to move with a slow undulation, which is hailed by the assembled congregation as a sign of the presence of the guardian angels, whose wings by their motion are supposed to produce the waving 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 prayers, preaching, or the performances of devotions. The Zemzem, or holy well, is supposed to be the spring found in the wilderness of 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 found, and where this spring has been discovered men have supplied a copious 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, and the objects of amusement are intended to be joined to it, but having a separate door, is a small room with a stone reservoir, which is always full of Zemzem water; this the hajji get to drink by passing their hands with a cap through an arched grating, which serves as a window, and into the reservoir without entering the room. From before dawn till midnight the well-room is constantly filled with visitors. It is considered a miracle that the water of this well never diminishes, and has never even overflowed the reservoir. The ascent to the Kaaba is made by a covered staircase, on which is a window looking into it. Burckhardt 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 is reduced by the hands through which it passes, to a small proportion of its true value.

The inhabitants of Mecca, with few exceptions, are Arara from different countries; but they have amalgamated, and they wear the same dress and have adopted the same customs. They have two houses, one in Mecca and the service of the Beitullah; but the former has the preference, and there are very few ulama, or persons employed in the mosque, who are not engaged in commercial affairs, and who are on steps from the Kaaba. With 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 Nadj, who in want of India goods, drugs, articles of dress, and corn. The greatest profit however is derived from supplying food to the large numbers of pilgrims, and twenty times 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, covered with black and white cloth, and have establishments at Jidda, whence they receive all their merchandise.

Mecca was, up to recent times, governed by a sheik, who was raised to that dignity by the famous Black Stone, and the consent of the powerful sheik 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 government of different states has been diminished, and the Porte was no longer able to send large armies with the hajj caravans, the sheiks of Mecca being entirely independent, and disregard the orders of the Porte. But Mohammed Ali of Egypt has restored the
authority of the Osmanis in the Hedja, and usurped all the
power of the sherif, allowing to the present sherif merely a
nominal sway. The sherif is chosen from one of the many
tribes of sherifs, or descendants of the Prophet, who settled in
the Hedja; the number of these tribes is now reduced to a
few families of Mecce.

The succession is not hereditary, but although it seldom takes place without some
contest, there is little bloodshed in general; and though in-
stances are rare where, for any reason, the choice of those
princes is withheld, the principles of honour and good faith which distinguish the
wars of the Desert have generally been observed.

(Burchardt's Travels in Arabia; All Bey's Travels in Morocco,
Tripsid, Cyprus, Egypt, Arabia, Syria, and Turkey.)

MECHANICAL POWERS is the name given to certain
simple machines or engines, for these words are applied in

indifferently, either of which is occasionally used by itself in
moving bodies or raising weights, or any of which are com-
bined 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 of the point of application from a
certain 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.

The Levers are of three kinds; as the fixed fulcrum, the movable fulcrum, and the
free fulcrum. In the first, the fulcrum is placed under 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 part of a body to another, and is generally applied to that
power which 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 pro-
cured which could not be accomplished by the motive 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 the fixed points which serve for its support, so that only the
reduced power is supposed to do the work. 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 is inclined to the horizon and extending from the object to
the spot to which the latter is to be raised, 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; or several forces which will suffice for the attainment of the
end diminish in proportion as the length of the plane is
greater.

The manner of overcoming a resistance, which is specified in the
above, will serve also to explain the fact 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 evi-
dent 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 descrip-
tions of a vast variety of arts and sciences, and in the
abridged or dispensary, and the reader is referred to works which machines or engines are expressly
described, such as Gregory's 'Mechanics,' vol. ii., and Barlow's
'Treatise on Manufactures,' in the Encyclopædia Meto-
politana. (1)

In determining the efficacy of the mechanical powers it is
evidently necessary to consider their parts as mathematical lines,
and the ratio of the parts. The parts are, without a doubt, une-
qual 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 multi-
plied by the distance of the centre of gravity from the
fulcrum is to be added to the momentum of the weight
which is actually applied at the point of action of the lever.

The sums of these moments, when the actual mechanical
conditions are given, enable us to determine the relation
between the opposing powers. The conditions of equilibrium being determined,
the excess of the power which enters into those conditions will evidently overcome the resistance, or
produce motion in the machine.

MECKLEN, MEKLEN, or MECHELEN, ISRAEL VAN, a celebrated
artist of the sixteenth century, born probably at Mecken 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 writ-
ten 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 Mecken is not
Meister Israel the painter mentioned by several old writers.

There are eighteen beautiful old oil-paintings in the Pina-
kothek at Munich, and in some other collections, which
are attributed to Meister Israel; they are of the Van Eyck
school, but most of them have been found in the neighbour-
hood of Cologne and Cleveux, which is one of the reasons
for concluding that Mecken in Westphalia was the artist's
birthplace, notwithstanding Meckelen near Boon is in the
province of Gelder, where the artist is said to have
resided. Nevertheless, Lord Schlotheim is very evidently in favour of Mecken, 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
library of the late Mr. Vandyke. It is of the Israel's tombstone (since lost), which contains an inscription
in the old Gothic character to the following purport:-

In the year of our Lord 1605, died Master Israel van Meck-
len; his soul rest in peace, Lord. Israel van Mecklen, the
maker of oil-paintings, was born in the fifteenth
century, and is a representative of his nation. Thus, the
年限 of his birth is given as 1505.


Israel Van Mecken 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 1492 to 1505 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 Wymefeld, in his 'Rerum Ger-
manicarum Epitome,' c. 67, 'de pictura et plastica,' but from
this very circumstance it is argued that the goldsmith and
engraver Israel van Mecken cannot have been the painter
Israel Allemannus mentioned by this writer, as he was not
known until the first part of the fifteenth century, and is
therefore not the artist who painted "Venus in the
Wymefeld's" picture, which, as it is not possible to say this
picture was executed by Abraham Beer, the list.

Wymefeld, however does not say picturae or tabulaver: in
pectore, but icelis Allemanni, which may mean prints as well
as pictures, and hence it may be inferred that he was
influenced by and contemporary with Albert Düür, while he
noticed Martin Schoen, or Schongauer, an excellent engraver, as
already dead, of whom he says, 'qui fuit tam eximius.' He
generally clearly writes a time when engravings were not
only known, but very generally spread over Europe: his book
appeared first in 1605, at Strassburg, only two years after the
death of Israel van Mecken. From these facts it is
evident that there are not, as far as Wymefeld Concerned,
the slightest grounds for disputing the identity of Israel van
Mecken the engraver and Israel Allemannus the painter.

Lomazzo, in his 'Trattato della Pittura,' which was
published in 1568, in a famous book on art and
entitled 'Miheum,' gives an account of a painter
Israel. He calls him Israel Metric (Meken), and says
he was the master of Martin Schöen; but if we substitute pupil
for master we shall probably have the truth, for Israel studied
engraving or painting, and there are numerous prints made by him of Martin's prints. It is remarkable that out of the
three hundred prints and upwards, attributed with and
without certainty to the Israel, one only has the date fixed to it, and
that is the Virgo, or a Virgin and Child, which was upon
the half-moon, with the infant Christ on her left arm,
and in her right-hand a crucifix; the whole surrounded by
a glory of angels. On the margin of this print is 'Diua maculat
Tabulae pictae a diebus' (no date given), followed by his
signature and date.—'Israe1 V. M. A.' 1602,' the being re-
versed. It is No. 44 in Heinicke's list. His prints are
generally signed Israel V. M.: I. V. M.: I. M.; and sometimes
Israe. alone. He has engraved his own portrait twice: in one, his name is signed in full 'Israël van Meckenem, gold-smith'; the other, in which his wife is also engraved, is marked 'Francesco Israelis et Ioanni Georgii'.—J. V. Ysbr. The pictures attributed to Israël van Meckenem, 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 above life size. In execution of life they are equal to 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, Joachim and Anne at the golden gate, and several pictures of Apostles, in the Pinacothek at Munich, are very beautiful works, and if by Van Meckenem, he is evidently entitled to rank with the Van Eycks, Wilhelm von Köln, Hans Burgkma, Lucas van Leyden, and other distinguished masters of that time and school. Some of these pictures were drawn in lithography, in 1829, by N. Strixner. The supposed signature of Van Meckenem, with date, on a picture in the gallery of Vienna, mentioned in the catalogue of Von Mechel, is according to Bartch an error.

(Heleneke, Neue Nachrichten von Künstlern und Kunstsch.; Florillo, Geschichte der Zeichnenden Künste, &c.; Bartch, Peintres-Crest; Becker, Kunsthistor., 1839; Nagler, Neues Allgemeines Künstler-Lexicon; Dills, Gemälde in der Königl. Pinakothek zu München; Brulliot, Dictionnaire des Monnemarces, &c.)

Medicago (from medike, a beetle, and kuke, a resemblance), a genus of plants belonging to the natural order Papaveracae, and formerly referred to Papaver. This genus stands between Papaver and Argemone. It has 4 petals, numerous, short-styled, and many free stigmas, the capsule obovate, 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 is a biennial, which are very fuchas, and are seated on long peduncles which are infested before the opening of the flower, so that the flower-bud is drooping. It is an ornamental plant, and may be introduced into the garden. It will grow in a rich light soil, in a shady situation. It may be propagated by dividing the roots, or by seeds.

Medicago (from mughe, the Greek name of one of the species), a genus of plants belonging to the natural order Leguminosae, to the tribe Loteae, and the subtribe Trifolium. It has the calyx somewhat cylindrical 5-cleft, the keel rather removed from the vexillum; the stamina dinelephous; the legume many-seeded, of various forms, reniform, falcate, or costelate, but usually twisted in a spiral manner. The species are herbs or shrubs, with the stipules usually cut; the leaves trifoliolate, the leaflet usually toothed, and the pod long-tubed, flowered. They are numerous, upwards of eighty species have been described.

Medicago, Lucern, has many-flowered racemes; the pods compressed, spiral, with two or three turns, downy, unarmed, but shorter than the calyx; the leaflets obovate, oblong, dentate above, emarginate. 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 (Lucanus, P. C.), and Babington says that 'the wild specimens found are scarcely naturalised.' This is the mughe of Theophrastus, 'Plant. de Caus.' ib. 2, cap. 20; and the Medicago of Flinia, ib. 18, cap. 10.

Medicago, Falcata, has the racemes many-flowered, the pods compressed, sickle-shaped, downy, unarmed; the pedicels shorter than the calyx, longer than the vexillum; the leaflets obovate-oblong, decurrent, emarginate. It is a native of Europe on dry mountainous pastures. In England it is a rare plant, but is occasionally found on dry gravelly banks and old walls. L. V. the species is said to be the Lucern which is cultivated in Switzerland.

Medicago, Lupinula, Black Medick, or Black Nonsuch, has many-flowered dense oval spikes; the pods compressed, kidney-shaped, with a spiral point rugose with longitudinal branched prickles. The leaflets are acute, the stipules sessile, and the leaflets roundish-obovate, dentilicate above, emarginate, mucronate. It has a procumbent stem with yellow flowers, and is a native of Europe in meadows, pastures, and waste ground, and is very common in Great Britain. It affords excellent fodder for sheep, and must be treated in the same way as lucern.

Medicago, Arbor, Tree Medick, is a villous shrubby plant; it has obovate-cordate leaflets nearly entire; the stipules linear, acute, entire; the peduncles racemose; the legumes stipitate, twisted, reticulated from transverse veins; 2-3-seeded, the seeds somewhat flat, the fruit achenes, the fruiting head a large coma of down. The species which is native of the south of Europe, and appears to be the eurinum of Theophrastus, 'Hist. Plant.' ib. 4, cap. 5; ib. 1, cap. 9; 'De Caus. Plant.,' ib. 6, cap. 6; and the sererov of Dioscorides, lib. 4, cap. 113. The cited species is Medicago rumphii, Fl. lib. 18, cap. 24; Virgil, 'Ecl.' i. 79; 'Georg.' ii. 431.

Besides the first three species, described above, M. maculata, M. minima, and M. dentiugata are natives of Great Britain. M. maculata, and M. dentiugata were introduced into the British Flora as growing on the sea-shore at Oxford in Suffolk; Mr. Babington, in his 'Manual,' states that he is convinced, from personal observation, that no such plant now exists in the British Flora. The species of this genus is propagated by cuttings. 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. Fl.; Fras, Synopsis Plantarum Flora Classicarum.)

Medici, Gian and Giaimo, Marquis of Marignano, born at Milan in 1450, 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 states and France, for the defence of the duchy 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 Duke of Milan, to whom he was devoted, and 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 recovering 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 kept it for himself for years. After returning from his expedition, he went to Rome, and making predatory incursions among his neighbours. When Francis I. again invaded Lombardy, in 1526, Medici made an incursion into the Valley of the Ticino 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 disaster, Medici was acknowledged by the duke as feudatory of Musso and other places, with the title of Chatelan.

In the subsequent quarrel between Duke Sforza and his overbearing wife, who wished to place himself at the head of the disaffected Milanese emigrants, and annoy the Spaniards, but after a time, the Spanish governor of Milan succeeded in conciliating Medici, on whom he conferred the title of Duke of Musso; the latter, on the other hand, carved out a principality for himself at the expense of his neighbours. He again invaded the Vallassina and took Bergogno. At last, in the year 1529, Duke Sforza, partly by force, and partly by offering him a sum of money with an annuity and 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 1556 against the French in Piedmont. Having returned to Milan after the death of Duke Sforza, he was made Marquis of Marignano by Charles V. He then went to Spain, from whence he accompanied Charles in his expedition against the revolted 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 1555. On his return he was received by Duke Cosimo I. of Tuscany at Florence, with great honours and distinctions. The young Medici Tuscany, to the Medici of Tuscany was acknowledged by Cosimo, notwithstanding which it is still greatly doubted, or rather disbelieved. On his return to Milan, Medici fell ill and died in November, 1563, of a disease of long standing. He attended him in his last moments. His body was buried at Marignano with great pomp, but afterwards his brother Cardinal Giovanni Angelo Medici having become pope, in 1545,
MEDINA, the second holy city of the Mohammedans, and the place where their Prophet was buried, is situated in that part of Arabia which is called El Hedjaz, or Hedj, about 120 miles from Yembo, 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, interspersed with fields, enclose the town on three sides; on the side towards Mecca the rocky nature of the soil renders cultivation impossible.

The city forms an oval about 3800 paces in circuit, ending in a point. The castle is built at the point on a small rocky elevation. The whole is enclosed by a thick wall of stone, between five and six feet thick, and about six feet high; towers and surrounded by a ditch: it is well fortified for an Arabian town, and has always been considered the principal defence in Hedjaz. There are well-built gates leading into the town. The houses are well-built, entirely detached and two or more stories high. As the stone is of a dark colour, the streets have rather a gloomy aspect, and for the most part very narrow, often only one or two paces across; a few of the principal streets are paved with stone. The dimensions in the number of pilgrims of late years has caused a great part of the houses to fall into decay. There are only two large streets which contain shops. There are very few large buildings within the precincts of the city. The great mosque containing the tomb of Mohammed is the only temple. There are two fine mosques or colleges. The castle, standing at the western extremity of the city, is surrounded by strong walls and several high and solid towers. It contains sufficient space for 600 or 800 men, has many arched roofs, bomb-proof, and may be deemed impregnable against an Arabian foe. It contains a deep well of good water.

The suburbs extend on the west and south of the city, and cover more ground than the city. They are separated from it by an open space, narrow on the south, but forming on the west a space of some miles; it is of so close a cover of shrubs and trees. This open place has no walls, but on the outside they are enclosed by a wall of inferior size and strength to that of the city. Four gates lead through this wall from the suburbs into the city, and consist of two rows; there are also large court-yards with low houses built round them, and separated from each other by gardens and plantations; they are inhabited by the lower classes of the town and all those who are without houses or who cannot afford houses. This enclosure is about forty families, so as to form a hamlet by itself. The castle are kept in the midst of the court-yard, where there is a large well, and the only entrance is shut at night. In the western portion of the suburb are regular and well-built streets with houses resembling those of the city. There are two mosques in the suburbs, one of which is called Medjed Ali, or the mosque of the prophet's cousin.

The town is supplied with sweet water by a subterraneous canal which runs from the village of Koba, about three-quarters of a mile distant in a southern direction. The water is abundant, and in several parts of the town steps are made to carry it to the principal houses, and in about thirty places it is sold. There are also many wells scattered over the town; every garden has one, by which it is irrigated; and when the ground is highly cultivated the water is applied in abundance. Water is found in abundance on the various heights and on the slopes of the highlands, from the higher grounds to the lower depression in which Medina is built, and part of the city is inundated. All these circumstances, and the scarcity of water in the environs of Medina, a circumstance which made the city especially convenient for the considerable settlement of Arabs long before it became a

The mosque containing the tomb of Mohammed bears, like that of Mecca, the name of Haram, on account of its inviolability: but in other Mohammedan countries goes by the name of Medjed el Naby (Haram of the Prophet). The mosque of the Prophet was the place of the first compilation of the Koran. It is situated towards the eastern extremity of the city, and its dimensions are much smaller than those of the mosque at Mecca, being a hundred and sixty paces in length and a hundred and forty-three in breadth: but it is not built upon the same plan, forming an open square surrounded on all sides by covered colonnades, with a small building in the centre of the square. The colonnades are much less regular than those of Mecca, and the southern parts of the colonnade is composed of ten rows of pillars behind each other; on the western side are only four, and on the northern and eastern sides only three rows. The columns themselves are of different sizes. On the southern side, where the prophet's tomb stands, and which forms the most holy part of the building, they are of larger dimensions than in the other parts, and about two feet and a half in diameter. They have no bases and the shafts rest on the ground. The columns are of stone, but being all plastered white it is difficult to decide in what kind. The roof of the colonnade consists of a number of small domes, white-washed on the outside. The interior walls are covered with arabesques, and each one of the four principal sides is divided into one and part of the southern-eastern corner, which are cased with slabs of marble, nearly up to the top. The floor under the colonnades on the western and eastern sides is paved and is nearly covered with sand, as is likewise the open square. On the southern side the floor is paved with fine marble across the whole colonnade, and in these parts the floor of the tomb of Mohammed is paved with a plan, of mosaic, of excellent workmanship. Large lofty windows, with glass panes, admit the light through the southern wall; some of them are very well painted. On the other side there are smaller windows along the walls, but they are neglected.

Near the southern-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 protects the tomb from visitors, forms an irregular square of about twenty pieces, 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. This is the actual grave of the Prophet. Within 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 contains within the railings the two rows of colonnades, there is a recess so contrived that when praying, the railing is thinly plated over with silver, and the inscription 'There is no God but God, the evident truth,' is repeated in silver letters across the railing. The colonnades consist of three open gates, three of which are constantly kept shut, and one only is opened every morning and evening to admit the eunuchs, whose office it is to clean the floor and light the lamps. The enclosure is called el Hedjra. 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 fifteen dollars; but on entering the enclosure nothing more is to be seen than what may be observed when peering 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 silk brocade of various colours interwoven with silver and gold, and adorned with a band of inscriptions in golden characters running across the middle of it. This curtain has a small opening at the northern end, which is always shut, no person being permitted to enter except high eunuchs, the chief eunuchs, who take care of it, and who put on during the night the new curtain sent from Constantinople, whenever the old one is torn or worn out. The window it leaves open is in the northern or western side of the enclosure. The old curtains are sent to Constantinople, and sent to cover the tombs of the sultans and princes.

According to the historians of Medina the curtain covers a square building of black stone and supports a roof the interior of which are the tombs of Mohammed and his two earliest friends and successors, Abu Beker and Omar. These
toms be deep holes, in which the coffins are deposited; that of Mohammed is cased in silver. The floor between the curt-
ain and the galleries is inlaid with variously coloured marble in mosaic; glass lamps are suspended all round the curtain, and every evening the ornaments burn in 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.
As soon as ingress to Medina catch sight of it they repeat some prayers.

Near the curtain, and within the galleries, is the tomb of
Seuta Fatime, the daughter of Mohammed and wife of Ali; it is a close, with walls covered with a richly embroidered black brocade, and without any other ornament.

Mohammedan tradition says, that when the last trumpet shall sound Ayas (Jesus Christ) is to descend from heaven to
the earth, and to announce to the inhabitants the great day of
judgment; after which he is to die, and will be buried in the
Hegira by the side of Mohammed; that when the dead shall
rise from their graves, they will all rise together and ascend
to heaven, where Ayas 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 Ayas will be placed, and guarded.

Four gates lead to the interior of the mosque: a few steps are
to be ascended from the neighbouring streets up to the gates, the area of the mosque being at a somewhat higher level. The gates are usually closed about two hours after sunset the gates are generally shut by means of folding doors coated with iron, and not opened till about an hour before dawn; but those who wish to pray all night in the mosque obtain permission from the commanding 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
Buddhists but strangers, who have come to the place as pil-
gri
gs and afterwards settled there, or they are descendants of
such strangers. Medina is not so great a place of commerce
as Mecca, and the merchants are not so rich, but it has the advan-
tage of a considerable trade attached to it for cultivation, and there are many wealthy landowners in the
town, who let out their possessions to poorer 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.

(Burchardt, '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, and liable to be proceeded against from its being an old consuetudinary practice in Scotland, which
happens to be in unison with the late legislation of
England on the subject of debtor and creditor. In Scotland
no action of arrest on a warrant can be brought, according
to 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 judgment
of a court of law, or on the extracted registration of one of those
documents in which by a clause of registration for execution or
by commercial custom (as in the case of bills of exchange)
the grantor agrees to be put in the position of having a decree
recorded against him. A mediatic fugae warrant may be
granted by any judge having jurisdiction in questions of
debtor and creditor, as by a sheriff, a magistratus of a burgh, a judge of
an anterior court, etc. Where granted by a sheriff, the
late act, the advantage that it may be executed in any part of
Scotland, whether or not within the jurisdiction of
the sheriff who grants it (1 & 2 Vict. c. 110, § 25). The grant
of a mediatic fugae grant that at 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 sides, may, on his discretion, be satisfied that if the
magistratus on a distinct oath of debt should refuse to commit,
he is personally liable to the creditor for the consequences,
and that if, on the other hand, he grant a warrant on an
impossible statement, he shall be liable in damages to
the person committed. At all events a person desiring a
mediatic 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. 6d. (100.
Scots) was abolished in Scotland, and it was lately found by
the court of session that mediatic fugae warrants come within the
act.

MEGALICTHEYS, a genus of fossil Ganoid fishes, from
the carboniferous strata of Edinburgh, Glasgow, Leith, Man-
chester, etc. (Agassiz, 'Recherches sur les Fossiles
Poissons'.)

MEGALODON, a genus of fossil Conchils, proposed by
Goldfuss. From the Devonian strata.

MEGAMORPHIA, a genus of ferns, found on the conti-
measures. (Arts. Antediluvian Phytology.)

MELALEUCA (from μῆλος, black, and λευξ, white), a
genus of plants belonging to the natural order Myrtaceae.
It has the calyx-tube nearly hemispherical, the limb 8-petate;
the petals 5; the stamens numerous, combined into 5 elon-
gated bundles, which alternate with the petals; the anthers
incumbent; the stilo filiform, the stigma obtuse; the capsule
comanate with and enclosed in the thickened tube of the caly-
x, which is sessile on, and adnate at its base, to the flower-bearing
branch, 3-seeded, many-seeded; the seeds angular. The
species are trees or shrubs with alternate or opposite entire
leaves, with white, yellowish, or purplish oil. They are
found
in the Antediluvian, and other East India islands.

MELARUMAGE, CASSIEPI, P.C.)

M. Leucodendron, White-tree, or Cajeput-tree, has alter-
nate long lanceolate acuminate filate 3-5-nerved leaves;
the flowers borne in clusters pendulous, the flowers in spikes
rather distant, which, as well as the racis, are quite gla-
rious. It is a native of the East India islands, and was at one
time supposed to yield the oil of commerce. Roxburgh asserts
that it produces an oil which it probable that this oil is
rarely 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 de-
sirable for the conservatory or greenhouse. They grow well
in a mixture of peat, loam, and sand, and may be propagated
by cuttings, which will readily take root if planted in a pot
of sand and placed under a hand or bell glass.

(Mandley, 'Flora Medica; Don, Gardener's Dictionary.')

MELAMON, a genus of plants (lychnis, scutellaria),
which, 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
margin by means of a depressed nectariferous tube; the sepals
expanded, ob-
lige academically compressed; one or two seeds in each
smooth. The species are annual plants, with opposite lanceolate
linear entire leaves, with opposite usually second terminal
flowers. Eight species are enumerated by Don, six of which
are European and two Americans. Of the six European four
are natives of Great Britain.

M. cristatum, Crested Cow-wheat, has the spikes densely
imbibed, 4-sided, and the bracts heart-shaped. It is a na-
tive of woods and thickets in the eastern counties of England,
and also generally of the north and middle of Europe.

M. aureus, Purple Cow-wheat, has lax conical spikes, and
orange-yellow flowers.

M. pratense has the flowers axillary, second in distant
pairs; the calyx closed; the upper lip protruded. It has
large pale yellow flowers. It is a native of Great Britain,
but not a common plant. It is said that it is a species of
M. pratense, with an open calyx, and lips equal in length.
It is a rare plant, and found in alpine woods.

(Mabon, 'Manual of British Botany; Don, Gardener's
Dictionary.')

MELASTOMA (from μῆλος, black, and στόμα, a mouth,
because the berries when eaten stain the mouth black),
a genus of plants, the type of the natural order Melastomaceae.
It was the tube of the calyx ovate, half-adhering to the ovary, densely covered with scales or bristles; the limb 5- rarely 6-cleft, the segments alternating with the appendages, both deciduous; the petals 6-5; the stamens twice the number of the petals; the anthers linear, a little arched, opening by a pore at the apex, each furnished with a stipe-formed connective, which is in some species elongated, and in others short, but always biseriate or emarginate in front; the fruitlet part of the ovary central and bristly; the style filiform, somewhat thickened at the apex; the stigma a pruinose dot; the capsule baccate, 5-6-celled, opening irregularly; the seeds carunculate. The second species of this genus are shrubs, which are usually covered with strigae. The leaves are peltate, and either quite entire or serrulate. The flowers are large, white, rose-coloured, or purple.

Melilotus, Malabar Melastoma, is a shrubby plant with tetragonal branches rough from strigae; the leaves elliptic-oblong, obtuse at the base, acute at the apex, quite entire, green on both surfaces, and scarious from strigae; the corollas 1-5-flowered; the calyx clothed with admixed strigose scales, with ovate acute lobes, the connectives of the anthers short, or very long. It is a 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 World, in Asia, Africa, America, and South America. 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 greenhouses.

(Lindley, Vegetable Kingdom; Don, Gardener's Dictionary.)

MELICA, a genus of plants belonging to the family of Gramineae. It has rarely glaucous leaves, with lateral ribs, nearly as long as the ovate spikelet of 1 or 2 flowers rounded on the back, and a club-like rudiment of one or two more; the palisade hardening on the loose fruit; the styles terminal. There are two British species of this genus, M. xerophita and M. mutana, which are found in damp shady woods.

(Babington, Manual of British Botany.)

MELILOTUS (from μελίς, 'honey', and λοτος, 'lotus'), a genus of plants belonging to the natural order Leguminosae. It has a calyx with five nearly equal teeth, the keel obtuse, the filaments filiform, the ovary straight, the pod subglobose or oblong, 1-celled, 1-4-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 as such; they are employed in florists' gardens, and in botanical collections. Two of the species are used as fodder for animals.

(Mellor, P. C.) Two species are found native in Great Britain. M. officinalis, the common Mellilot, has lax racemes, with the calyx short and the keel equal; the pod ovate, acute, compressed, transversely wrinkled, hairy; the leaflets serrate, truncate, narrowly ovate; the stipules setaceous, entire. M. vulgaris has the leaflets longer and keel equal, but shorter than the standard; the pod ovate, obtuse, mucronate, reticulate, rugose, and glabrous. It is a rare plant, and is found in sandy and gravelly places near the sea.

M. Messemaea, Messina Melilot, has an erect stem, with obovate-cuneate dentilicate leaflets; the stipules broad at the base, toothed, linear at the apex; the racemes few-flowered; the teeth of the calyx nearly equal, hardly shorter than the standard, very much narrowed, 1-seeded; the seeds ovate, compressed, large, black, rugose from dents. This plant is a native of Barbary, Sicily, Piedmont, and the Straits of Messina. It is the Lotus of Theophrastus, Pliny, and Dioscorides, and λάυρες ἅμαρτων of Dioscorides, lib. iv., cap. 171. It is also the Lotus of the Romans (Pliny, xiii. 17; xxxii. 21; Virgil, Georg. i. 84, and iii. 394).

The petals, the calyx teeth, and stamens are very much cultivated as ornamental plants. They may be easily propagated by seeds, which should be sown in the open border in spring. A light, very poor soil suits them best.

(Mcllwain, Manual of British Botany; Don, Gardener's Dictionary.)

MELISSA (from μέλισσα, a bee), a genus of plants belonging to the natural order Labiate or Lamiaceae. This genus has been 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 Balm, and some of these species have been described under Calamintha, P. C. S.
The typical species of this genus are:

r_Melissa officinalis, borem by two Angeli, 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 in England, in 1688. His engravings were much esteemed in France, and are still much admired. (Florent Le Comte, Cabinet de Singularités, &c.; Huber, Manuel des Amateurs, &c.)

MELIORE. The Linnean genus Meliora included the several genera of heterothallic Dipsacaceae, especially the family Cardiaceae, interesting on account of its including those beetles known under the name of 'bitterling flies,' and employed in medicine. The term mellio is now restricted to the aperous Callitrichus and the Sanguinaria, and all the species with large and swollen bodies, and short oval elytra, laying over each other at the base of the nuture. They are sluggish creatures and feed on various plants, especially the species of Myriophyllum. Some of them are often found in the leaves of the plants on which they are feeding. Their legs are oily, yellow, or reddish liquid. Latreille maintained that the insect was the bespritz of the ants, to which noxious qualities were attributed. (See his paper on the subject in the 11th volume of the Mém.
It is well clothed with wood, and presents one of its forest foliage. The upper part of the elevated 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 sinking 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 rattan (Flagellaria indices, Linn.) lead into these swamps.

The soil of the island is of inferior quality, paking of the character of the ironstone which is generally spread over it. The surface after digging two feet and a half is much better, being a brown mould of a saporous texture. Close to the shore the country is very rocky, and the soil is light and shallow, intermixed with sand and gravel. Bordering on the swamps it is richer and more productive, and it is supposed that some of the flats so situated are capable of producing rice.

Vegetation is very luxurious, and during the whole year there is plenty of grass for cattle. The timber is of general good quality, and although trees which are small in the stem predominate, there are many of considerable dimensions, and applicable to house-building, furniture, ship and boat building. The most common tree is the ironstone, of which the average height of trees to an acre is about one hundred and twenty, but in some places they amount to one hundred and eighty. Among these four trees several species of eucalyptus are most abundant. The eucalyptus is a wild tree.

The most common quadrupeds are kangaroos, opossums, bandicoots, native dogs, a small brown rat, and a species of squirrel. The Termeia 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 (Dacelo gigas), swamp spoon-bills, quails, currawongs, wild ducks, sand-hawks, wild pigeons, several kinds of cranes, and a wild fowl of the gallinaceous order of considerable size. Many beautiful small birds are very abundant. The variety of states, nature, and length of life, is very great; some of them are venomous. There is also a great variety of lizards of beautiful colours: the largest are the frilled iguana (Chlamydosaurus Kingi), and the common iguana (Iguana delicatissima). All the birds above in Aspley Strait, and turtles are found at some places on the coast.

The most destructive of the numerous insects are the white ants.

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 on fish, turtles, crabs, and other shellfish. The marine产物 are the cabbage-palm and fruit of the sago-palm. They are evidently of the same stock as the natives of Australia, but they are more active, energetic, and enterprising. Their language is said to be so far different that a native of the southern coast could not understand one 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 the sheath of bark, are studded with strips of split cane. They are extremely diffident of strangers, and it was found impossible to enter into any friendly intercourse with them during the four years that the British flag has been hoisted on Aspley Strait.

The settlement on Aspley Strait, called Fort Dundas, was formed in 1824, for the purpose of attracting to it the commerce of the eastern part of the Indian Archipelago. But in 1828 the island was sold by the inhabitants of the island, and it was ascertained that the soil was far from being fertile, and the climate very debilitating to Europeans, although not absolutely 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.
Bruges, and he added very probably to Memling. Vasari apparently alludes to Memling when he speaks of Aunee (Anese) of Bruges. The dates of Memling's pictures range, according to the printed accounts, between 1450 and 1499. The most valuable of these are those of the Madonna of Aragon, wife of Philip of Burgundy; this picture is mentioned in the anonymous Journal published by Morelli in 1800 — Notizie d'Opeue di Degoeno nella prima Metà del Secolo XV. in its early form, painted by Memling, Bruges. Croma, and Venezia, scritta da uno Aunee di quel Tempo, in which the picture is called Mamertino or Memelino. If this date be correct, Memling must have been born before 1439. He was living at Bruges in 1467, and he may have been there nearly all his life. The date 1497 is found on a small picture in the possession of M. van Ertborn 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. It was not long afterwards: the account is given by Ponz, in his Viaggio de' Spagnoli.' This convent was destroyed by the French in 1412. Memling appears to have lived some years in Spain: he is supposed to be the Juan 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, Duke of Burgundy, both as painter and as warrior. The story is, that he was at the battles of Granson and Morat, in 1476; and in the beginning of 1477 was admitted, ill from wounds and distemper, into the Hospital of St. John at Bruges. It was a poor Hospital for old and injured soldiers. In five of these pictures the work is attributed to Memling, and the others are in his style. It was during his residence in this hospital that he painted the beautiful pictures which still adorn that hospital, and for which his name is, among the painters of the fifteenth century, one of 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, expatiately painted in oil, in many compartments, upon a red case of a gothic design, known as La Chasse de St. Ursule. This chasse, or shrine, has been the subject of a special work by Baron von Keverberg, intituled Ursula, Princesse Britannique, et ses peintres: Memling, Ghent, 1816. The paintings have been drawn in lithography by MM. Manche and Ghemard. Memling painted also during his stay in this hospital the small picture of the Adoration of the Magi, and 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 usually the case in 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, attended by saints. In the background are painted episodes illustrating the lives and martyrdoms of the attendants saints and of St. Catherine herself. The left wing is the beheading of John the Baptist; the right wing is St. Catherine of Alexandria. In the left compartment 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. Antony 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 reported. There are three other pictures by Memling in this hospital: a Descent from the Cross, on wood, with two wings; the Madonna and Child, with a portrait of Martin van Nieuwenhoven, burgomaster of Bruges in 1497, on the wings of the picture; and a Madonna of the Virgin, and a female, inscribed 'Sibylia Sambetha quae est Petrae an: 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. This is inscribed: 'Memlin' was painter to the Hospital St. John at Bruges, and a female, marked: Dr. Water well not mention it. Another very interesting work, by Memling, is the collection of Mr. Aders, the travelling altarpiece or altar of the Emperor Charles V., which was preserved in the cathedral of Bur-
anlying name. Few of Memmi's works now remain, and there are performed more performant that the principal among 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, Saint Peter Martyr, and part of the legend of the Dead Christ, restored to Pisa and transcribed in it.

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 completion of the frescoes, in 1336, and he was invited to Avignon.

[GADDI, TADEO, P. C. S.] There are also some stories by Memmi, from the life of San Ranieri, in the Campo Santo at Pisa: they are engraved in Lasinio's 'Fitture dei maestri della Schiuma.'

Simone painted also in miniature. There is a MS. of Virgil, 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 poetical muse; before him is Æneas in armour, with his sword, representing the Æneid; there are likewise a shepherd and a tiller of the soil, representing the Erotes and Georgics; 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:

'Venus Virgilium qui talia semina fist, Seu talia Memmi dixit qui talia placet.'

Memmi died in 1344, according to the necrology of the Dominicans at Siena, aged sixty, according to Vasari, but much older according to Della Valle and some others.

Vasari, pointing out the inconstancy of 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 surmised 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,' Plate, ex. 22, and in Cigoli's 'Storia della Scultura,' Plate, ex. 43. The latter of these figures represents, however, some other reputed portraits of Petrarch and Laura, at considerable 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 Laurenziana at Florence, which however may have been copied from the original work by Memmi: there is an outline of this also in Cigoli's work, i. p. 42.

Vasari gives the following as the inscription on Simone's tomb, but he does not say where:—Simoni Memmi pictoris oris tonum omnis actae celeberrimae. Vixit ann. LXX. mens. il. d. ilij. —His chief excellence was invention.

Vasari, who was brother-in-law to Simone, assisted Simone in some of his works, and completed others which were left unfinished at his death. He was not equal to Simone, though a better colourist than he: there are a few of his heads in the antique manner which he was living.

[Vasari, Vite de Pittori, &c., and the notes to Schorn's German translation of Vasari; Della Valle, Lettere Senesi; Lanzi, Storia Pittorisce, &c.; Rumohr, Italianische Forschungen.]

MEMMI DI MARTINO. [Simone, P. C. S.] MENANDER, ARRIUS, a Roman Jurist, at the time of Severus and Caracalla. The only work of his mentioned in the Florentine Index is four books on Militaria. There are also excerpts from Menander in the Digest.

MERCHANT SEAMEN. [Sirev, P. C.] MERCER, LOUIS SERBAUEN, a prosperous writer on men and manners, politics, science, the drama, literary criticism, and many other subjects. The greater part of his works are sunk in oblivion, but several of them still deserve and obtain attention. He was born at Paris on the 6th of June, 1740. He was for some years professor of rhetoric in the college of Bordeaux. The works for which he chiefly deserveth attention at the present day are his attacks on the manners and institutions of his age. The first of these appeared in 1771, with the title 'L'An 2440;' Rêve, s'il en fut jamais.' In 1781 he commenced the publication of 'The Tableau de Paris.' Having courted the attention of the authorities to his anti-bullying works, which, had they been published in the hands of the liberal institutions of France, was sure to provoke their wrath, he found it prudent to retire to Switzerland, where he completed this remarkable work. Without holding with its author that the 'Tableau de Paris' produced the French Revolution, 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 ends. It was frequently reprinted, and was translated into an animated, descriptive, and biting pen. He occasionally appealed to a high sense of morality, but his chief power lay in showing his readers the bad taste and the folly of the prevalent corruption, and in severely denouncing the base industry struggling against false social laws, or the remnants of prismatic simplicity holding out against the inroads of corrupting manners, his tone has dignity and feeling. When he speaks of the French, he is always careful to administer a wholesome diet of the artificial and vicious tides of the fashion, of the tenuity over the free expression of opinion, he overrules with sarcastic ridicule. The work is a curious anatomy of French society, and exposes many evil incidents to large cities, of which the lapse of sixty years has not entirely enabled us to find the remedy. The sanatory regulations which have lately so much occupied the attention of society, and other means of social organization, are intended to supply deficiences which Mercier points out in his own peculiar fashion: whether he could have devised remedies for the defects he discovers may be questioned. He was a master of paradoxes. In 1801 he published 'Néologie, ou Vocabulaire de Mots nouveaux, à renouveler, ou pris dans des Asceptions nouvelles,' a work in which he announced such propositions as:—'The name of France is a diminutive of France; it is 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 his work is a good one: in the science of politics, he was against the best-established truths in physical science. From these peculiarities his attacks on the social morality of his age have been received as造成的 blows struck in a right quarter by a man who strives genuine, that the author of his 'Tableau' has thus frequently been looked on as no more the result of just observation than the censorious remarks of a universal grumbler, who, living in a brothel or a gambling-house, pretends the authenticity of this and that impropriety by which he was surrounded. But Mercier deserves a better appreciation, and none can attentively read his censure without seeing that they proceed not only from a confirmation 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 too attached to him that he perpetually displayed with singular simplicity his sublime self-conceit. He died on the 25th of April, 1814.

MERCURLIUS, a genus of plants belonging to the natural order Euphorbiaceae, has discursive or monstrous flowers; the style short and forked in the female flowers; the capsule 2-seeded; the cells 1-seeded, bursting at the back. The species are herbs; two of them are natives of Great Britain.

M. perennis, Perennial Mercury, has a simple stem, the leaves stalked, ovate-oblung, rough; the female flowers long on common stalks; the root creeping. It is a native of woods and hedges.

M. annua, Annual Mercury, has the stem branched, leaves stalked, ovate, or ovate-oblung, smooth, the female flowers nearly sessile, the root fibrous. It is a common plant in waste cultivated lands. It once had a place in the British Pharmacopæia on account of its supposed efficacy as an emmenagogue, but it is not now used for that purpose. The leaves abound in magnotious matter, and are cooked and eaten in Germany in the same way as we eat spinach. Professor Burnett has pointed out the peculiar instability of the stamens of this plant. At the period when they are fully developed, they are touched by the flower, the flowers are forced into buds, and, being then forced inwards, have their stipules, and, and voilâ elliptically towards the pistillate flowers.

[Burnett, Outlines of Botany; Babington, Manual of British Botany.]

MERCURY, DEPRESSION OF. [Depression of Mercury, P. C. S.] MERIAN, MATTHEW, a very distinguished German portrait painter, was the son of the eminent engraver of the same name. He appears to have been born at Antwerp in 1621. He was the pupil of Sandrart, who was much attached to him; he studied also after Vandyck in London; became acquainted with Le Sueur and Voset in Paris,
and studied under Sacchi and Carlo Maratti at Rome. From about 1730 to 1750 he was the chief print-engraver in his father's book and print business, at Frankfurt 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 other statesmen and statesmen of historic persons, and engraved a few plates, which are marked M. Merivan, junior. He died at Frankfurt, in 1837.

Matthew's sister Maria Sibylia Merian was an eminent in- scence of watercolor painter. She died at Amsterdam in 1717, aged seventy.

(Sandart, Teutsche Academie, &c.; Fiorillo, Geschichte der Zeichenden Künste, &c.)

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MESMERISM. [Animal Magnetism, P. C. S.]

MESOLONGHI or MESOLEO'NGI, perhaps the ancient Olene, Όλενη, in Aetolia, a small town in Greece, lies on the northern side of the Gulf of Patras, near its entrance, and right opposite Cape Kologria or Papas in the Morea. It became remarkable during the last Greek insur- rection against the Turks, as is stated in the life of Bozjariz in the Greek letters, and the character 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 Mesolonghi popular throughout the world.

Mesolonghi is built on the edge of a marshy plain, bounded on the north by the high ridge of Zygos, the ancient Arseny- thus, and is protected towards the sea by a lagoon extending across the Gulf of Patras, which is cut into the land, and encloses the Vassiladi, on which the Greeks had built a small fort; and by the sea, by the town of Anadotiko. At the time of the outbreak of the Greek revo- lution the town contained several thousand inhabitants, who derived wealth from their extensive fisheries. The fortifications were in such a state that the allied fleet of 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. The enemy, under the Turkish commander in Northern Greece, in the beginning of 1825, many Greek palikars and others flocked to Mesolonghi with their families, so that the garrison was increased to about 5000 fighting men. Their provisions were reduced, and the town was invested and bombarded by the Turks, under the command of General Lord Byron, of the 2nd of August, 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- to 48- pounders, two brass 10-inch mortars, one howitzer of 5 inches, and one mountain howitzer of 4 inches. The Turks made the first breach on the 5th of May, and on the night of the 11th of June, the great bombardment began. Bombardments and stormings now succeeded each other during two months, but the fire was well answered from the rampart, and the Greeks made frequent sallies, in which the besiegers were almost always defeated. In the beginning of July, the Turks found their 2nd howitzer of 48 pounds, and the Hydriot village lying at the entrance of the lagoon, to be occasion of many evacuations and provisions in the town, till, on the 10th of the same month, the great Ottoman 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 assailed, and a terrible and complete deli- cation destruction among the houses and their inhabitants; but the Greeks stood their ground, and were excited to hopes of certain victory when, a few days afterwards, the great Greek fleet under Moulis 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 ad- ditional population of 10,000 women, children, aged and infirm men. Reshid Pasha, however, was far from being discouraged, and resolved upon still more vigorous attacks; but Sultan Mahmud, who was bent upon the possession of Mesolonghi, 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 General moved northward, and towards the end of November the combined fleet of Turkey, Egypt, and Barbary, drove the Greek fleet from the lagoon, and kept a strict watch over its entrance. During the whole of the months of December and January, the Greeks were com- pletely cut off, and they made some sorties and noted the Greeks to make an attack. In the beginning of the month of January, the Greek fleet was cut off, and the garrison continued to be kept in constant danger of starvation they would not capitulate, and continued their deadly sorties, when at last, Ibrahim, after having taken the islands of Poros and Anadotiko, made the town a heap of ruins by an unrelenting and perfect destruction of the whole town, and a few months after the date of the fall of the fortress, Ibrahim Pasha appeared in the Egyptian camp, and they might have escaped with their families without incurring great risk of being either...
driven back within the fortress, or mass 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 with avidity, the garrison resolved to cut their way through the Egyptian defiles and effect a retreat into the neighbouring mountains. According to the best authorities the population consisted, in the month of April, of about 6000 persons. Three thousand fighting men were to rush headlong from the besieging army, and, when the heroes of Mesolonghi 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 were females, escaped, of whom, however, 600 were starved to death in the mountains; and Ithobal boasted of having taken prisoners 3000 soldiers, and from 3000 to 4000 women and children. Many of the captives were afterwards ransomed through the exertions of the Philhellene societies in Europe. Nothi-Bonzaris and Mitcho-Koutyiani, though both upwards of seventy, escaped safely. Among the slain were Joseph Frat, the chief merchant of the town, Tony Papedizopulos, the General Stourazia, Sadimus, and many other Greeks of note. Among the Germans, Baron von Riedesel and Lieutenant Rosier were killed during the siege; Colonels Dillois and Delaunay, Captains Baron von Glinow and Stelzberg, Lieutenant Kneckl and Schiap, and several other gentlemen fell in the sortie. With them remained on the battle-field Dr. Meyer, another German, who was the editor of the "Greece," and among the men who was equally enraged with 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 parent. 'The defeat of our countrymen. My relation have drawn up of the siege survive me.' This relation was unfortunately lost.

Thus fell Mesolonghi after a siege of twelve months, and after 100,000 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 modern language in which poems were not written on the heroes of Mesolonghi.

(Gordon, History of the Greek Revolution.)

MESOPOTAMIA (from the Greek μεσός, 'middle,' and ποταμός, 'river'), the country between the two rivers, is a term which includes part of the Greek and Babylonian Mesopotamia (Strabo, and others) to comprehended all the countries which lie between the rivers Euphrates and Tigris, and it is still in use. The Arabians call this country by the corresponding name of Al Jawf, and the citizens of the towns and cities which are situated in the political division, geographers do not agree as to the extent of the countries to be comprehended under this name. Some confine it to the country itself, or those lying between 35° N. lat. and the Chalda 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 Rizhik, on the reverse of the Black Sea, directs his steps 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 mountains, which is an indication that a retreat into the plain of Asia from east to west, and which in antient times went by the name of the Taurus and Antitaurus. This northern chain is traversed in its length by the parallel 40° N. lat. As it is called Northern, it is always covered with snow, and many summits are 18,000 feet above the sea-level. From these mountains the view ranges southward over an elevated table-land, that of the Frat extends southward and westward the highest part, and whose surface varies from 3000 to 6000 feet above the sea-level, but several of the mountain masses attain 10,000 feet. On the south of it, between 38° and 36° 30', lies the hilly region of Mesopotamia, or the subsidience 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 embraces all the countries between the two rivers, or between 36° and 34° lat. This region is separated from the low plain of Babylonia by the Chalda or Median Wall, which begins on the banks of the Tigris, near 34° N. lat., and it terminates on those of the Euphrates, near 33° 30' N. lat. This important water-course divides the country, and is the most conspicuous feature in the whole region. It encircles the fourth region, the plain of Babylon, or of Iraq Arabi.

1. The table-land of the Frat and Murad lies between 40° and 38° N. lat., and between 36° and 44° E. long. 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 25,000 square miles, or somewhat less than that of Ireland. It constitutes 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 in 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 Karu-su, for Erzerum is nearly 6000 feet, and Erzinjan 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 highest point on the table-land near Chalid is near as at sea; at Falu 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 northern part of the table-land, is elevated to a height of 10,000 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 Khazar Dagh, extends the table-land on the south. It begins on the coast with the Nimrud Tagh, a high peak west of the Lake of Van, and rises above the snow-line and more than 10,000 feet above the sea. Hence the Khazar Dagh and the mountains of the Nigor form a great table-land, where the Euphrates makes its great bend opposite the town of Matalayik. 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 Isgolu or Fizoglu and Gerger. No mountain-range forms the borders of the table-land on the east, where it extends almost on the parallel 40° N. lat., as the parallel 60° E. long. that marks 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, and at nearly equal distances from the northern and southern borders of the table-land, there are two other great masses, of which the eastern is called Bingol, Tagh, and the western Dujik Tagh. The declivities of the last-mentioned range approach the banks of the Frat above its confluence with the Murad. The two mountain-masses are probably separated from each other by a wide depression, and both rise above the snow-line. These 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 general gradual rise of the table-land, makes this 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 portion of the region, as regards the extent of the surface, is rated the great mountain-mass, especially in the countries which are separated from each other by a wide depression, and both rise above the snow-line. This mountain-mass is a great chain of mountains, and is divided into two main masses: the northern ranges extend almost east and west, and the southern ranges have a northerly direction.
The surrounding country is very fertile, and considered the most populous portion of the table-land.

II. The Hilly Region of Mesopotamia, or the Subalpine Region of Mount Taurus, lies to the south of the Kzarzan Tagh, from which it is separated by the lower declivities of the mountains which enclose the valley in which the Murad river runs, that forest occurs, and even there they consist only of underwood, especially willows and dogwood.

But a considerable portion of this region is fit for agriculture. The rivers do not always run in narrow valleys, but frequently traverse depressions, which on account of their extent may be called plains, and extend from forty to forty miles long, and from ten to twelve miles wide. Such are on the banks of the Frat, the plains of Erzerum, and Erzincan, and on those of the Murad, the plains of Mshh and Kharapat, and a number of smaller plains. Near the banks of the rivers these plains are usually swampy, but in general they possess a considerable degree of fertility, except some of the higher grounds, which only yield abundant crops in wet seasons. These plains differ greatly in elevation, and consequently in climate and productions.

The Plain of Erzerum and some smaller districts in its vicinity are nearly 6000 feet above the sea-level. The winter is long and cold, commencing in the beginning of November and continue to April. Snow sometimes falls in the commencement of June, and the corn is gathered in September. But during the summer months the heat is excessive, the weather is dusty, and few places are found necessary to irrigate the fields. The plains of Northern Europe grow very well, and yield rich crops, especially wheat and barley, but only a few of the harder fruit trees are cultivated. The tame and domesticated animals are very numerous, and the sheep of uncommon size. The plains of Erzincan, Mshh, and Kharapat, are about 3000 feet lower. Though the winter here lasts four months, the heat is much more favorable to the growth of many plants and trees. The corn is ripe in the month of July, and the orchards and plantations of trees are numerous. Grapes and melons are extensively cultivated, and the fruit of the mulberry-trees is held in great esteem. These advantages, united to the extensive pasture-grounds on the higher portions of the table-land, have rendered these plains the abode of a numerous population. This region is politically divided into two pashaliks, those of Erzerum and Mshh, and contains several populous places. The most important of them are the following:

Erzerum. [ERZERUM, P. C., vol. x., p. 8.]

Erzincan, on the Frat, is built on an extensive well cultivated plain, on which there are about one hundred villages, and inhabited by 3000 families, or about 18,000 individuals. The corn, which is the staple article of food, is of a very fine quality.

Egin is in a rather narrow valley, between steep mountain masses rising to 4000 feet above the Frat, whose declivities, however, to a considerable height are covered with orchards and plantations of trees. The number of the numerous villages in its vicinity is from 400 to 600 families. The valley is too narrow to admit of cultivation on a large scale, and the population, which is great, lives almost entirely on the fruit of the white mulberry-trees, which here, as in some parts of Afghanistan, is dried and used as bread.

Kebkan Maaden, on the Euphrates, a mile and a half below the place where the Frat and the Murad rivers unite, is built in a ravine enclosed by bare mountain masses. It owes its existence to the silver-mines in its vicinity, but they are not very productive. The population consists of between 400 and 500 families, all of them engaged in mining.

Jesr (Jesir) is a well situated inhabited plain, has 8000 inhabitants, who are partly engaged in manufacturing iron utensils, carpets, stockings, and linen-cloth. It has some commerce with Erzerum, Bithia, and Diarbekir.

It is situated about 475 feet above the level of the Murad river, which washes its base. It contains about 1000 families, some of which are engaged in weaving coarse cotton-cloth, for which there are 200 looms, and others in dyeing and finishing them. The valley is bordered by orchards. About twenty-four miles east of Palu, and about two miles from the southern banks of the Murad river, are the iron-mines of Sivan Maaden, where the mineral is very abundant, and the ore is of a very soft and easy quality. The Turks began to work the mines some years ago. Kharapat is built on a cliff rising 1000 feet above the adjacent plain, and contained in 1835 about 6000 individuals.
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... 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 mulberries and apricots, 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.

... in the southern hills 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 nearly continuous, these masses consist of the border of a table-land which occupies the whole country between the Euphrates and Tigris, north of 37° N. lat. and compels the Tigris to run eastward and the Euphrates west; north of about 40° N. lat. they are widely separated; but sixty miles farther south, between Rumkalah on the Euphrates and Jezirah Ibn Omar on the Tigris, they are more than two and a half 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 Severceck and terminating with the hill on which the town of Martin is built. This ridge appears to be properly called Marja Daglieri. 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, according to Ainsworth, the surface of the country is composed, 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. This consists of a fruit of plants which are common to the basin and trap, and these have a soil fit for cultivation, or at least good pasture-ground. 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 Karaja Daglieri, the surface of the table-land is most 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 defy 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 those west. The whole country is very dry. The summer is so great that nearly the whole is a desert, with the exception of some depressions, whose surface is formed of trap or basalt, and where a few villages occur with some cultivation. In the northern part of the Euphrates where the mountain-masses have sunk down to 1200 or even 800 feet above the level of the river, the edge of the masses is split and indented, and numerous small valleys are here crossed by high ridges. Some of these valleys are fertile, but the largest part of them is covered with ochards, consisting of olives, pomegranates, mulberries, pears, peaches, and quinces; all of them have also excellent vine plantations. In some parts cotton is cultivated.

... the country through which the caravan-road between Bir-eh-Jik and Mosul runs, has great variety of soil and soil. Between Bir-eh-Jik and Urfa it is hilly, and contains many cultivated tracts. Farther east, as far as Martin, culturing and wooded tracts, mostly situated in depressions, or valleys alternate with plains, in which some cases afford pasture, and in others are quite sterile. This tract is very uneven, and the surface is broken by numerous small valleys and hills, with the river of a conical shape. These ridges continue to Nishin, but are less frequent. Between them run some watercourses, which are used for irrigation, and soon lost in the desert country south of Urfa. At Erebis the season is very dry, but as in this part there are numerous watercourses, the adjacent country has pasture even during the summer months. After having passed Tel Rumaklah the road leaves the HillyRegion 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 mountain-ranges which surround it on the east, north, and west, and its more southern stations, but the private 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 country is exposed to a different direction, and 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 hardly ascends to 30°, and in July sometimes descends to such a height as hardly any rain falls to the end of October, or the commencement of November. The thermometer rises to 50°, and all grass and minor vegetation dries up. Pasture is then only found on the higher and level places. Water is very common in many places of the table-land. Nature becomes resanned in the month of November, when the Nide clouds appear, which proceed from Mount Lebanon eastward, and bring to the country 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), lentiles, cicer arsituinum, Lathyrus sativus, vicia hispanica, phascolus maximus, durra (holcus orghanum) and medicago sativa. Other vegetables are several kinds of cucumbers, melons, solanum melongena, ribes, cucumis esculentus, and pumpkins. The orchards and plantations consist of olives, figs, pomegranates, pears, quinces, cherries, peaches, pomegranates, melons, figs, cherries, American plums (Prunus american), three other kinds of plums, apples, pears, quinces, cornelian cherries, almonds, walnuts, hazel-nuts, chestnuts, and cumbra kernels (the tree which has been so much abused by Ainsworth). The wild vegetation consists of castor-oil (ricinus communis), hemp, flax, saff (cannabina tinctoria), cotton, and trigonella foenum graecum are also cultivated. Among the wild plants are capparis spinosa, mustard (sinapis orlando), liquoress (glycyrrhiza glabra), asparagus, and arum coilocacine; the leaves of the last are used as paper.

... Sheeps, goats, and goats constitute the wealth of the nomadic tribes. There are thousands of sheep, the Tartaric, 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 plain: 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, hares, jackals, bears, polecats, martens, marmots, hamsters (cretius vulgaris), squirrels, porcupines, and hares. There are several kinds of vultures, falcons, and owls; ravens, crows, jackdaws, thornbills, and various small birds. The chemical minerals in the Turkish rivers, the Euphrates and the Tigris, and in several of their confluents. There are also several kinds of turtles, snakes, and lizards.

... The Eil Bey 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 river coast between Kir-eh-Jik 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 Kharaz Tagh, are very rich mines of copper, in which vicinity are two towns, one of which is called Arghana (or Arguma) Maden, and the other Madan Kapur. Arghana Maden is built about the summit of a high hill, 2887 feet above the sea-level, and contains some 800 houses, and according to others 600 houses. The declivities of the hill are partly cultivated with wheat and cotton, and partly planted with orchards and vineyards. The proper mining town, which is called Madan Kapur, is situated 14, or 15 miles distant from Arghana Maden, in a district destitute of vegetation, and contains about 4000 inhabitants, all of whom are employed in the mines. The produce of those mines formerly amounted to 400 tons, but in the last two years, on account of modern improvements, has been nearly ceased; but as in this part there are numerous watercourses, the adjacent country has pasture even during the summer months. After having passed Tel Rumaklah the road leaves the Hilly Region and enters the desert.
Kharun Tagh, is the town of Ilijeh, which contains 1000 families, and where some cotton-stuffs are manufactured: in the neighbourhood maize is cultivated.

At the eastern extremity of the Plain of Diarbekr, within the Kharun Tagh, in a very alpine country, is the town of Bitlis, 5000 feet above 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, galins, and gun trussaand, which are the produce of the country, and is the cotton for the manufactures of the town, which appear to be numerous; it has also several dyeing-houses and distilleries.

Some builds near the northern extremity of the Plain of Diarbekr, 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 Bitlis and Ilijeh.

Along the caravan-road are the towns of Urfa or Orfa, Mardin, and Nisibis. Urfa (the antient Edessa), is the most western, is at the base of a hill, and is a well-built large place, which is frequently compared with Damascus. 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 object in the town, and on the western moorings, which is 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 sciences.

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 Kbraska Desert; its town is 1000 feet above sea-level, and it was 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 Rehabeel, after a course of probably two hundred miles, and by a vast depression of about 300 feet, bounded on the east by the mountains of Tagh, and on the west by the hills of Makhul, and Saruj, and covered with a large portion of alluvial land, and to be equally fertile. The degree of fertility of the Abd-al-aziz 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 was 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 Rehabeel, after a course of probably two hundred miles, and by a vast depression of about 300 feet, bounded on the east by the mountains of Tagh, and on the west by the hills of Makhul, and Saruj, and covered with a large portion of alluvial land, and to be equally fertile. The degree of fertility of the Abd-al-aziz Hills is not known, nor their extent and direction.

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 many 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 many conical hills from 80 to 100 feet in height; they are red and reddish, and are broken by some. 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 about 1500 feet above the plain. This is an agricultural district. Considerable quantities of wheat, barley, and cotton are produced 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 are gathered in large quantities, together with 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 land, strongly impregnated with saline matter. The most common vegetable production is an oat-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 collection is greatly hindered by a rather steep ascent of 500 feet from the plain to the hill, which is 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 emplacements called "Alums," which have been traversed by the Tigris, grown 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 descend above the level of the river, and 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 emplacements called "Alums," which have been traversed by the Tigris, grown 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 descend above the level of the river, and 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 emplacements called "Alums," which have been traversed by the Tigris, grown in their natural state with grass and small tamarisks, but where cultivated giving abundant crops of grain or rice.
the banks of the Tigris from the south-east. The Jebel Makhlul may rise about 600 feet above the level of the river: it consists mostly of two ages, and is composed of one mass of truncated cones. It is a waste land. At its western base is a large tract of country with a sandy soil, which contains a great number of hither wells that are frequently visited by the nomadic tribes of the Arabs. The banks of the Tigris, between Jebel Makhlul and the town of Tekrit and a few miles to the north of it, are uninhabited on account of the neighbourhood of these tribes. Between Tekrit and the Median Wall the alluvial tract on the banks of the Tigris grows much wider, and appears to have been formerly well cultivated. This tract was interrupted by a large canal which still exists under the name of Ishaki, and extends from the town of Tekrit to Bagdad; a great number of smaller canals of irrigation are connected with it. There are no large rivers, except the Tigris, in the season abundant for pasture for buffaloes and horses. The number of islands in the river decreases, and they are no longer cultivable; their soil consists of sand and mud. Such is the country between Hit 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 few hours above Feliubah; 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. to S.S.W. It is an embankment or wall, 40 paces thick, and towers or battlements. It extends along the whole of the wall and on the side it has a deep ditch, 27 paces broad. Near the Tigris it is built of the small pebbles of the country, and near the Euphrates of a pebbly and cement of lime of great tenacity. It is from 30 to 40 feet in height, and is probably 500 years old. It is built of bricks, and in some parts went down level with the desert. According to their tradition it was built by Nebuchadnezzar (Nimrud) to keep off the people of Ninuwa (Nineveh), with whom he had an unpleasant war; and they call it Suid Nimrud, or Chalû (embankment).

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 the heat begins to increase. It is generally hot in the middle of June, and in the month of July the heat of the desert is sometimes endured. But every effort of man is opposed to the raising of crops between Hit and the Tigris; and 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. A few date-trees are planted.

At the mouth of the Khabur river some extensive woods, composed of high trees, especially tamarisks and palms. 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 used as pasture. The number of islands increases as we proceed farther south; they are partly bare and partly wooded with tamarisks. As we reach the banks of the Tigris, the vegetation begins 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 Hit. The alluvial tract of land is very extensive. There is great state culture, and is richly surrounded by plantations 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, in a high state of cultivation, and full of fertility. It is mainlly to this, which is ascribed to the system of irrigation which has been introduced.

A great number of canals traverse the river bottom in its width, extending from 200 to 2000 yards from the banks, and the water, raised by machines 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.
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 Hilla, Basoras, and Hadd, a distance of some ten miles, where the boats pass through the canal of Salkiwiyah. The mode of navigating the river resembles that practised above two thousand years ago. (Herodotus, i. 194.)

Between those two towns, and before the peak Arabi, extends from the Median wall (34° N. lat.) to the confluence of the Euphrates and Tigris at Korash (31° N. lat.), and between 44° and 47° E. long. In length it does not much exceed 1,000 miles, yet more than doubles that distance in breadth of water. Between Felujah and Bagdad it is not more than forty miles wide, but lower down it widens to a hundred miles. Eighty miles may be the average width. This gives to this region an area of 10,000 square miles, or less than two-thirds the extent of Ireland.

This is the Babylonian which is described by Herodotus (i. 138) as a fertile tract, and as the seat of an immense population. At present this country is a desert. But when we consider the immense space over which the ruins of Babylon are scattered, and the large tracts in the interior of the country which are covered with continuous heaps of ruins, indicating the seat of a once populous Tigris to the confluence of the Euphrates and Tigris, from each other, of the existence of which towns nevertheless not the slightest indications occur in the ancient writers or the Arabian writers of the middle ages, we must come to the conclusion that we are much mistaken in this sense of the seat of a people, who had attained a high degree of civilization, and that the famous city of Babylon was only the last of the numerous cities which successively were built there and destroyed. The civilization probably goes as far back as that of Hindustan. Its destruction is chiefly to be ascribed to its situation between the two elevated table-lands of Iran in Persia, and of Nejd in Arabia, which are not adapted for arable cultivation to any great extent, but must remain the dominion of nomadic tribes, whose character and habits make them the scavengers of cultivated countries, and the destroyers of each other's works.

Babylonia attained its high degree of cultivation by a system of irrigation. The whole region was traversed by numerous larger and smaller canals running in every direction, by which abundance of water for irrigation was supplied to every spot. This circumstance, united to a summer heat which is not inferior to that of the tropics, enabled the soil, which is by no means of a superior description, to yield fifty or sixty fold the seed. The principal canals for irrigation extend across the whole country from the Euphrates to the Tigris. They occur chiefly in the northern and southern districts, and this is evidently to be attributed to the different levels of the Euphrates and Tigris canal. The northern part of 32° the level of the Euphrates is considerably higher than that of the Tigris, and the water in the canals runs with a moderately strong current from west to east and falls into the Tigris. All the canals of the southern parts, as the ones planted by the Euphrates below Basoras, as the one from the town of Hilla to the Euphrates below Basoras, and consequently the water in the canals runs from the Tigris to the Euphrates, from north to south. The construction of these canals goes back to the remotest ages, but they have been made so substantial, that at present, after many centuries of neglect, a great number of them still impart a degree of fertility to the adjacent fields, and two of them have actually been navigated by steam-boats; it is probable that several others which are known to exist would serve the same purpose. The most northern of these canals is the Salkiwiyah canal, which runs from the castle of Felujah, and not far south of the place where, according to the accounts of the natives, the Median Wall terminates on the banks of this river, and reaches the Tigris below Bagdad. Though the direct distance between the two terminations of the canals is not more than 45 miles, its length is 70 miles, because for two-thirds of its course near the Euphrates there are many bends; 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 circumstance, the quickness of the current, which runs through it, and the necessity of its being fortified, is inferred from the position of its banks, which never rise above the level of the adjacent country, and are frequently lower. It appears to prove that this part of the Salkiwiyah is a portion of a running stream and 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. Farther on the country adjacent to the canal presents a boundless prairie, and the only objects which distinguish it from the desert are the black tents of the nomadic Arabs. By this canal the wicker-boats of Hit bring the produce of the country contiguous to that place to Bagdad, and it has twice been navigated by steam-boats. In the first place, when the river at Tigris 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 navigated by steam-boats.

The Salkiwiyah is considered to be the Isa canal of Abuhelda, who mentions three other canals further south, which cross the whole width of Babylonia, and these canals still exist. They are called, from north to south, the Nahr Abu Gharib, the Nahr Melik, and Nahr Dhiya. We have no particular account of these canals. These four canals leave the Euphrates between 33° 30' and 39° 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 Hiyeh, which carries the waters of the Euphrates into the Tigris. It begins at the small town of Kut el Amara, a miserable village on the eastern bank of the river, nearly a hundred miles below Bagdad in a straight line, and 176 miles measured along the windings of the Tigris. The canal begins at the town of Kut el Amara, and enters the Euphrates nearly opposite Arje or Arbana, about fifty miles above the confluence of the two great rivers. They are joined by two canals, one that flows from the Butje-Thatar, and the eastern Sa-yid Nawain; their mouths are about five miles apart. The tide ascends the Euphrates as far as Arje. 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 last Babylonia expedition; but only the western branch is navigable, the country to the east of which consists of large settlements, and a considerable traffic is carried on it. At no great distance north of the western mouth of the Shat el Hiyeh 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 Nahr Dhiya. 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 Hiyeh, it is navigated by the river boats, which are made at Hit.

The banks of the Euphrates, from the place where the Salkiwiyah canal joins the river, to the mouth of the mill, are called the town of Hilla, are of moderate height. The country adjacent to them is of indifferent fertility, and is mostly overgrown with grass, thistles, and mimous. Cultivation is limited to a small number of large fields near the river. The number of cattle, sheep, and goats is not great. It appertains to be little inhabited, and only from time to time a grove of date-trees is seen. Below Hilla the country improves greatly; a large portion of it is under cultivation, and the plantations of dates are more numerous. It is a populous country: between Hilla and Diwaniyeh a number of large villages are observed, the population of which was estimated by a traveller at 10,000 individuals.

A short distance below Diwaniyeh begin the marshes of the Euphrates, which lower down are called the marshes of Lembas or Lamul. They extend about forty miles north of the Castle of Felujah, and not far south of the place where, according to the accounts of the natives, the Median Wall terminates on the banks of this river, and reaches the Tigris below Bagdad. 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 there are many bends; 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 circumstance, the quickness of the current, which runs through it, and the necessity of its being fortified, is inferred from the position of its banks, which never rise above the level of the adjacent country, and are frequently lower. It appears to prove that this part of the Salkiwiyah is a portion of a running stream and not a canal. Near the Euphrates the banks are thickly dotted with bushes of liquorice,
Mesopotamia is called the canal of Yusuf (Joseph). It begins about half an hour above Diwaniyah and terminates at Graham Inlet. At its upper entrance it is seventy paces wide; at its junction with the Euphrates, it is about a mile, and at Graham Inlet, about 1,500 paces from its mouth. The length of the canal is about 23 miles, and its average depth is 12 feet. The canal is divided into sections, each of which is called a "branch." The branches are named after the month in which they are stowed. The branches are stowed in the month of November, and the water is drawn out of them in the month of January. The canal is divided into two main branches, the northern and the southern. The northern branch is formed by the confluence of the Tigris and the Euphrates, and it is called the "Great Canal." The southern branch is formed by the confluence of the Euphrates and the Shat-al-Hai, and it is called the "Small Canal." The canal is divided into three main sections: the northern section, the middle section, and the southern section. The water in the canal is drawn out of the basin of the Euphrates, and it is used for irrigation purposes. The canal is stowed in the month of November, and the water is drawn out of it in the month of January. The canal is divided into sections, each of which is called a "branch." The branches are named after the month in which they are stowed. The branches are stowed in the month of November, and the water is drawn out of them in the month of January. The canal is divided into two main branches, the northern and the southern. The northern branch is formed by the confluence of the Tigris and the Euphrates, and it is called the "Great Canal." The southern branch is formed by the confluence of the Euphrates and the Shat-al-Hai, and it is called the "Small Canal." The canal is divided into three main sections: the northern section, the middle section, and the southern section. The water in the canal is drawn out of the basin of the Euphrates, and it is used for irrigation purposes. The canal is stowed in the month of November, and the water is drawn out of it in the month of January. The canal is divided into sections, each of which is called a "branch." The branches are named after the month in which they are stowed. The branches are stowed in the month of November, and the water is drawn out of them in the month of January. The canal is divided into two main branches, the northern and the southern. The northern branch is formed by the confluence of the Tigris and the Euphrates, and it is called the "Great Canal." The southern branch is formed by the confluence of the Euphrates and the Shat-al-Hai, and it is called the "Small Canal.”
beethoven 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 an uncultivated desert. The greater part of the plain is traversed by the great canal called the Ishahi, which extends from the neighbourhood of Tekrit to the Saklawiyah canal, but is without water. There are also many other canals of smaller dimensions. Of these the most important is the Khoshuai near Bagdad 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 Arabsians, are common. There are hardly two or three villages which have a permanent population. As we approach the confines of the Turks 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 raise.

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 to the left of the river, is lower and undulating. The soil is composed of sand and pebbles, and in most parts overgrown with coarse grass, minnows, and thistles. The water is generally brackish. Between the higher points and the lowest, the outline of the plain is formed by the incrustations of the Saklawiyah and other canals. Further south the surface is less uneven, and the soil consists of clay covered with mud, intermixed with flint and small fragments of gypsum. In the middle is a row of sanddrills, which appear to cover a considerable space. In many parts efflorescences of nitre and other salts occur, which in some places form nearly a white crust on the ground. On the banks of some of these streams there are peculiar formations, which have been designated the Shat el Hieyeh. The number of settlements is considerable, and some of them are surrounded by fields of rice and other grain.

In the country just described occur the numerous groups of ruins which have already been mentioned. Many of them are seen by those who navigate the Euphrates in passing through the marshes of Lamlum. They appear to lie in a line, which begins at Hit Hymen in the north [BARTON, F. C., vol. iii., p. 206], and extends from north-west to south-east, terminating at the lower course of the Shat el Hieyeh. Though the country has only been visited by two or three Europeans, we are already acquainted with nine or ten of these groups. The forms such masses in that level country they are frequently taken for natural hills, until a closer examination shows that they contain a great number of pieces of glass, pottery, and bricks thrown or scattered by the wind over the plain itself. In some of them fragments of columns have been found.

With respect to the climate of this region the reader is referred to Bagdad [F. C., vol. iii., p. 270], the remarks in which article may in some measure be applied to the whole region. Its productions are enumerated in the Pashalik of Bagdad [F. C., vol. iii., p. 268]. Besides the town of Bagdad, a few places occur on the banks of the Euphrates which require notice.

Hilla is a fortified place with about 25,000 inhabitants, Arabs, Persians, Turks, Jews, Armenians, and Indians, in the midst of a number of canals, which probably part the fell. It carries on a considerable commerce with all the towns of the Euphrates, mostly in river-barges of 50 to 80 tons. The imports consist especially of rice, dates, fish, oil, coffee, cotton-stuffs, and Indian goods, part of which are re-exported to Hit and Annah.

Diwaniyeh, lower down, a considerable place, with 1600 houses, is enclosed by a wall. Numerous river-barges are regularly employed in the produce of the rich country in its vicinity to other places. This is the principle if not the only market which is visited by the nomadic tribes of Nejd in Arabia. They bring to this place cattle, horses, wool, and gum, and take in return lead, fire-arms, one of different kinds, and culinary utensils. From this place the British settlements in Hindostan are supplied with horses.

Mesopotamia is inhabited by nations of different origin. Owing to its position between two table-lands inhabited by nomadic nations, it is frequented by most of the Turks and their 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 which claim to be aboriginal are the Armenians and the Yezidis. The Armenians are dispersed over the table-land of the Frat and Murud, and the Hilly Region of Mesopotamia. The first-named region to the south of the Euphrates contains the Frat, which 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 Hilly 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. [AZMITIA, F. C., vol. iii., p. 282].

The Yezidis are a small nation, who exclusively inhabit the Sinjar hills, and also isolated tracts in the eastern districts of the hilly region of Mesopotamia and in Kurdistan. Though they are said to have been born for ages on this scene, the Yezidis, or Mowayah, the destroyer of the race of Ali, they are evidently different from the other nations of the country. They are of a middling size, and have a clear complexion, with regular features and black eyes and hair; their limbs are spare, muscular, and well proportioned. The hair is long and the beard and whiskers kept close short, but they are prohibited from cutting or dressing the mustachio. Their religion is a strange mixture of the worship of the devil with the doctrines of the Magi, Mohammedans, and Christians. They consider the devil as the chief agent in executing the will of God, and reverence Moses, Christ, and Mohammed, believing them more or less to be the incarnations of Satana. They adore the sun as symbolical 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 escaping from danger. They are brave, hospitable, and sober, faithful to their promise, and 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 another nation, who are generally considered as an original people. It is probable that when the Armenians generally adopted agriculture, those parts of their country which were unfit for cultivation, owing to the rigour of the climate, became like the desert, and possessed by the Kurds. They adore the sun as symbolical 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 escaping from danger. They are brave, hospitable, and sober, faithful to their promise, and 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.

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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 immigrating tribes were not powerful enough to occupy large tracts of pastoral ground. In such cases they selected a tract fit for cultivation, 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 tracts of land, and cultivated them as fit for settlement. The 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, the especially the case with the powerful tribe of the Shammar, which is found, but the principal seat of the last-named tribe is in the desert which extends from the Euphrates to Damascus. The cultivated tracts of the desert are in possession of some smaller Arab tribes, who are tributary to the Shammar. Other Arabic 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 tribe of Kaselal, which inhabits the marshes of Lamul. 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 region have been compelled to adopt the habits of the occupants of swamps, but they have preserved their activity and their spirit of independence. The numerous tribe of the Montefci occupies the land in the region of the Tigirs, which is 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 Montefci are much more agricultural; the date-plantations, the oases, and the furnishing of their wealth, but poorer 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 the political changes to which Mesopotamia has been subject since it was named in history as the birth-place of Abraham. There is no part of the globe on which such changes have been so frequent and so great. From the sway of the kings of Babylonia Mesopotamia passed successively to that of the Assyrians and Medes, and then it was subjugated by the Persian and then the command of Cyrus. 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 got possession of it. Seleucus founded the kingdom of Syria, of which Mesopotamia formed a portion, until the countries belonging to the Syrian kingdom were divided between the Romans and Parthians. During many centuries Mesopotamia was the theatre of the wars in which these two nations contended for superiority, until the Parthians were supplanted by the Persian dynasty of the Sasanides, when Mesopotamia was dismembered between them and the Greek emperor of Constantinople. But at last the Arabsians appeared, and their victory established the seat of a wide-spread and powerful empire in Mesopotamia. Since the destruction of the kingdom of Babylonia, the country had not enjoyed so much prosperity as under the caliphs; but after these princes had lost their power, Mesopotamia fell into the hands of the Turkish princes, the Seljuks and Aqbecks. About the beginning of the twelfth century a portion of it was conquered by the Crusaders, who however did not keep it long, and after the conclusion of the peace of Acre it was left to the Crusaders. The Seljuks and Aqbecks overran this part of Asia. Their progress was for a time interrupted by the famous Timur, but after his death the Osmanli empire acquired the ascendency, and subjected 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.

(Ker Porter's Travels in Ancient Babylon.)


**MESPLUS**, a genus of plants belonging to the natural order Rosaceae, to the suborder Pomaceae. (Pomae, P. C. S.) It has the calyx 5-cleft, the segments foliaceous, the petals nearly orbicular, the disk large, full of honey; the styles 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 in 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 and varieties of this species of medlar. The following are the garden or cultivated varieties:

1. Blake's large medlar.
2. The seeder, 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 obvolute fruit, not much cultivated.
4. Nottingham, common, small-fruited, or narrow-leaved Dutch medlar. It has an obvolute middle-sized fruit, and is the best of all the medlars.
5. Smulth, Smith's Medlar, has oblong 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 medlar may be propagated by seeds or by layers, or by grafting upon seedlings of their own species or any kind of Pomeaceae. Forsyth remarks that the kinds of Medsplits do better by grafting on their own stocks. The soil best adapted to the growth of the medlar is a light and rich earth, rather moist than Koordistan, but not on a moist bottom. It may be grown either as a standard or as a quinquennal. The general horticultural treatment should be similar to that of the apple-tree. For a further account of the pomaceous genera of Rosaceae, see Pomae, P. C. S.

(Don, Gardner's Dictionary; Babington, Manual of British Botany; Loudon, Arborum et Fruticetum 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-
parts to have rested with the Lyon King at arms, sided 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 impugnment of their conduct, and in their dismission from office. The Keeper has been appointed for the proper and legal performance of his official duties. Messengers require to perform their functions with great precision, as they are not only amenable to questions regarding the accuracy of their proceedings, but also to suits for the recovery of the fees set on their services. The legal accuracy of which the title to landed property may depend.

METAMORPHOSIS, VEGETABLE. [Vegetables, Metamorphosis, P. C. S.]

METEOROLOGY. [Electricity, Atmospheric, P. C. S.]

METOPTOMA, a genus of fossils ( allied to Patella? ), proposed by Professor Phillips. From the mountain limestone of the north of England.

METRODORUS, a distinguished antiquarian painter and philosopher of Athens, born about two centuries before the Christian era. "After the death of Persaeus by Paulus Emilinus, in Greece, n.c. 168, the Roman general ordered the Athenians to send him their most able painter to perpetuate his triumph, and their most distinguished philosopher to educate his sons. The Athenians paid Metrodorus the extraordinary honour of declaring to Paulus Emilinus that he was both their greatest painter and their most distinguished philosopher; and the Roman general is said to have performed the ceremony himself.

As Metrodorus was chosen to paint the triumph of Paulus Emilinus, and to educate his sons, and gave him satisfaction in both respects, we must infer that he did paint his triumph, though it is not known what of; as to the education of his sons it has been an undertaking of great magnitude, and indeed, if adequately represented, a very extraordinary performance, for in the procession of this triumph, which is particularly described by Plutarch, there were two hundred and fifty waggons containing Greek works of art: the spectacle lasted the entire day.

Pliny, Hist. Nat. xxx. 40; Plutarch, Paulus Emilinus, 32.

METROPOLIS. [Colonv, P. C. p. 359.]

METROPOLITAN. [Archbishop, P. C.]

METROPOLITAN STAGE-CARRIAGE. Before proceeding to give a brief notice of the law relating to hackney and stage carriages in London, we may quote, from two interesting papers on the 'Vehicular Statistics of London,' in 'Chamber'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 embraced in the article HACKNEY-COACH, P. C. S. These papers, we may observe, are of the highest authority. 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 former, is here traced. The term hackney, which has been an undertaker of great magnitude, and indeed, if adequately represented, a very extraordinary performance, for in the procession of this triumph, which is particularly described by Plutarch, there were two hundred and fifty waggons containing Greek works of art: the spectacle lasted the entire day.

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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 the usual charge is sixpence per passenger, whether for the whole or a part of the journey; but a very large portion of their receipts arises from 'short' passengers, or such as are picked up on the street. Omnibus proprietors are much exposed to peculation on the part of their servants, and various mechanical contrivances called 'tell-tales' have been tried to protect their interests by registering the number of passengers carried, but they have not proved especially useful; but 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 to watch him by taking his places as passengers, and reporting at headquarters the numbers taken up, as a check upon him; and so systematically is this service performed, that any attempt at deception is sure to be detected and punished by dismissal or dismissal by penalty 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-outs (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 individual, by him.

The laws which relate to hackney-carriages and metropolitan stage-carriages are chiefly comprised in two acts of Parliament: 1 & 2 Wm. IV. c. 42, which came into operation on the 1st of January, 1834. An Act to amend the laws relating to Hackney-Carriages, and to Waggons, Carts, and Drays, and to place the Collection of the Duties on Hackney-Carriages and on Hawkers and Pedlars in England under the Control of the Customs; and 1 & 2 Wm. IV. c. 50, 24th 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 cab-nolets) are five miles from the General Post-office, London; and drivers of hackney-carriages are compelled to drive five miles from the place where hired or from the General Post-office; but if any hackney-carriage 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, hack-fare may be charged, so long as the said limits or 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 Wm. IV. c. 22. 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 two shillings for the first half-mile. The charge for the hire of two horses is the same as that for one horse, and if the carriage be occupied by any number of two or more persons.

HACKNEY-CARRIAGES AND MANUFACTURERS, &c.

Hackney-Carriages and Metropolitan Stage-carriages are licensed by a registrar, deputy-registrar, or other officer appointed by one of Her Majesty's principal Secretaries of State; and every driver and 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 exhibit, and the wearing thereof may be distinctly visible.

Omnibuses are among 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 6d. is charged on every licence, and 5s. is paid for it, 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 or alter their own fares, but those fares are to be distinctly painted or otherwise made known as the number of persons for whom the licence is issued.

Hackney-Carriages standing in the street, though not on any stand, to be deemed plying for hire. Drivers may ply on Sunday, but not on holidays.

Hackney-Carriages under the authority of the 'Metropolitan Stage-Carriage' Act are under a distinct system and are distinct from ordinary hackney-carriages.

The act & 6 & 7 Vict. c. 86, repeals a previous act (1 & 2 Vict. c. 79), and extends the enactments not specifically repealed of 1 & 2 Wm. IV. c. 22, to the 6th section, and to the definitions of the terms employed. Other provisions of the acts relate chiefly to the restoration of property left in carriages, tourious driving, intoxication, insulting language, loitering, and other acts of misbehaviour; to proceedings of proprietors, drivers, and conductors, as to licences, payment of duties, contracts with each other; and to modes of granting summonses, powers of magistrates, punishments, penalties, &c.

METRISIDIA: Rhus (from μητρίς, the heart of a tree, and σίδης, 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 annular, adhering to the ovary, the limb 6-cleft; the stamens 20-30, free, very long, and exerted; the style filiform, and stigma simple; the capsule 2- or 3-celled, the cells many-seeded; the seeds wingless. The species are dioecious, with opposite or alternate leaves, with the flowers pedicellate; the fruit is a berry. They are all in the genera Melaleuca and Callistemon. The last genus, with Angophora, has been recently separated from Metrissidia.

M. rura, true Iron-wood, has opposite ovate-lanceolate acuminate quite glabrous leaves seated on short petioles; the cymes axillary, pedunculate, many-flowered. It is a native of Java and Ambonaya, 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 mucus discharges, discharges, and dysentery. It is usually mixed with some aromatic, as penang, cloves, or nutmeg.

M. polymorpha has opposite coriaceous leaves, of various forms, glabrous on both surfaces, but covered with a little silky tomentum; the leaflets thd at the summit; the leaflets terminal and axillary, corymbose; the calyxes and bracteoles glabrous or clothed with silky tomentum. This species is a tree, and grows in the Sandwiek Islands, and is said to be the plant from which it is wrong to make the clubs which the other white islands employed in warfare by the South Sea Islanders. The Akii or Libragum Vitae of New Zealand, the Rata and the Poko piano of the same country, are all hard-wooded trees belonging to this genus, and called 'rhozoioides.' (Lance-leaf Rhoea.)

Several other species of Metrosideros have been described, natives of New Holland and the South Sea Islands. M. huia, a beautiful tree, occurs as far south as Lord Auckland's Islands, and is extensive over and near New Zealand; and T. cun- dingham is the New Zealand plant called Akii, and is a rambling shrub, adhering to trees, and climbing by means of its lateral
MEY, HEINRICH, a German designer and painter, and a distinguished man in the fine arts. He was born in 1759 at Zürich, and he was for some years the pupil of J. C. Füssli there. About 1786 he went to Rome, where he made the acquaintance of Goethe. In 1787 he was at Naples, lived there in the same b&-ne with Tieckheim, and became acquainted with Herder, then travelling in the suite of Amalia, Duchess of Weimar. In 1792 he visited, for some time, Weimar, and in 1797 established himself & became the leading painter of the town. He became a great favourite with the court at Weimar, & was in intimate contact with all the distinguished literary men of the place, & held, from 1807, the office of director of the academy there, & en- joyed the titular & absolute head of the whole school. In 1818, until his death in 1832 Meyer was chiefly engaged on literary commissions relating to the history and theory of art, but chiefly the history of Greek and Roman art. He was the principal editor of the comprehensive work on the history of the sciences of Kinkelmann, which were published in 8 vols. at Dresden between 1818 and 1820 inclusive, and was the author of the greater part of the numerous notes by which they are illustrated. These note he afterwards arranged and connected into a consecutive history of Greek art, under the title ‘Geschichte der Bildenden Künste bei den Griechen,’ 2 vols. 8vo., Dresden, 1824. A third volume, being the continuation of the history of Greek art in Rome, was edited by Dr. F. W. Riemer, after the death of Meyer, under the title ‘Geschichte der Bildenden Künste bei den Griechen und Römern,’ 1 vol. 8vo., Dresden, 1836. This work, though agreeably written, and containing a good general account of the history of art, is defective in the treatment of works of ancient art, has failed to satisfy those interested in the subject, and has obtained little popular or general notice. In the first place its form is against it: the text and the author’s remarks are separated from the illustrations, while the latter are not occasionally as large as the whole pages. The text is little more than a chronological catalogue of names and works; and the notes at the end of the volumes, besides being troublesome to refer to, as disconnected with the text, do not clear up the obscurities, or reconcile the apparent contradictions of ancient authors. Reflections are rare, and when they occur they are neither profound nor illustrative, nor does he in any case indulge in aesthetic remarks, or attempt to deduce the general principles of art from the volumes. The text is little more than a chronological catalogue of names and works; and the notes at the end of the volumes, besides being troublesome to refer to, as disconnected with the text, do not clear up the obscurities, or reconcile the apparent contradictions of ancient authors. Reflections are rare, and when they occur they are neither profound nor illustrative, nor does he in any case indulge in aesthetic remarks, or attempt to deduce the general principles of art from the volumes. The text is little more than a chronological catalogue of names and works; and the notes at the end of the volumes, besides being troublesome to refer to, as disconnected with the text, do not clear up the obscurities, or reconcile the apparent contradictions of ancient authors.
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, on the southern east, and the Sete Cidades, 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, ending on the east, with the Fogo, 1031 feet above the sea, and terminating on the west with the Sierra Gorda, 1747 feet. The soil of this tract is in general very fertile, but there are extensive areas of light, sandy, and gravelly soil, which are only fit for vineyards. There are no hot springs or other signs of subterraneous heat, and the whole of this district is deficient in water, in consequence of its inferior elevation. The most western part of Michael's appears to be subject to volcanic changes than other parts. It contains in its centre a valley of an elliptical form, called the Cate Cidades, which is three miles long from south-east to north-west, and two miles 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 Carvao, which is 3633 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 places alluvial, in others morainic, well suited for cultivation and of great fertility, in others a mixture of punice and scoria, or a vitreous intractable lava which defies the efforts of man in some degree. Hot springs are frequently 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 very temperate, and the changes do 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 not one day in which agricultural labour may not be carried on.

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The mean temperature in winter is 62° and in summer 69-5°. The extremes of the whole year are 46° and 84°, in winter 46° and 76°, and in summer 66° and 84°, in February 46° and 72°, and in August 64° 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 other points of the compass in the ratio of 37 to 26, which indicates that the island is best situated to part of the Atlantic where westerly winds generally prevail.

The principal occupation of the inhabitants is the cultivation of the ground. The island contains 147,200 acres, of which 21,000 are occupied by vineyards, 22,000 by orange plantations and other vineyards, and 120 acres of vegetable gardens. The arable land amounts to 40,100 acres, and the remaining 102,600 acres are occupied by mountains, lakes, rivers, roads, and dwellings. The grains which are most extensively cultivated are maize, wheat, Indian corn, and barley. The cultivation of maize and wheat succeeds in several places on the southern coast. Several kinds of vegetables are grown, but the common people cultivate only cabbages and potatoes to any extent. As two-thirds of the wheat, Indian corn, and barley cultivated, the potatoes, and more rugged portions of the island are extensive. All the domestic animals of Southern Europe are kept, but the breeds are inoffensive. Of wild quadrupeds only rabbits, ferrets, and weasels are met with, 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 and peaceable people. Very few brandy or wine, and only small quantities of spirits are consumed by the individuals, are employed in agricultural labour. With the exception of the common mechanical trades, the manufacturing industry is limited to some coarse woolen stuffs, especially blankets. The industry of the coast consists of 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 is from the north the town is exposed. Michael's appears to have been Erebus and the Conception, with the wind to change to another quarter. The town is surrounded by extensive orchards and orange plantations, and is rather a pleasant place than a town. 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, 3000 inhabitants. In the vicinity of these places are extensive plantations of oranges and vineyards. On the northern coast is the town of Ribeira Grande, with 12,000 inhabitants. It has no harbour, being harnessed in by reefs of rocks, 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 manufactories of coarse woolen cloths and common lines.

The forest and woods are mostly confined to Portugal, but at present the island is visited by English, American, and Brazilian vessels. The number of English vessels which annually visit Michael's is about half a hundred, and about the same number sail between St. Michael's and Portugal. The American and Brazilian vessels are few. The English take only oranges, of which about 90,000 boxes are annually exported.

The other agricultural products, especially corn and maize, are carried to Portugal. The Americans take only gold and silver coin in return for their imports. The importation from England consists of several kinds of textile fabrics, iron goods, and corn; those from Brazil, of hides and colonial produce; the Americans bring timber and whale oil, and the Portuguese liquors, textile fabrics, colonial produce, silver coin, soap, and hats.

This island was discovered in 1444 by Calvet, and was settled in the following year. Since that period it has remained in possession of the Portuguese. (Boid's Description of the Azores, or Western Islands; Hout's Description of the Island of St. Michael, in London Geog. Journal, vol. xvi.)

MICHIGAN, since the article in P. C. was written, has become a State. A sketch of the new constitution and other particulars given under United States of North America, P. C. S.

MICHIPS. [Jovinella, P. C.; Humida, P. C.]

MICON (Mioor or Mioor), a distinguished Greek painter and sculptor, the son of Phanocles of Athens, and one of the most celebrated of the Greek painters for painting horses. He lived about the middle of the fifth century before Christ, and was the contemporary of Phidias and Polygnotus.
The picture of Micon is less known than that of the others of the eminent artists of ancient Greece. He was however one of the painters chosen by the Athenians to perpetuate their great victories in the Colonades of the Ceramites, which was enlarged or rebuilt by Cimon after his victories over the Persians; and he was also appointed to paint the walls of the temple of Theseus at Athens; an honourable distinction, indicating the highest eminence in his art.

Micon painted the battle of the Amazons and Athenians under Theseus, in the gallery of the Ceramikes, which was called subsequently, in consequence of this and other pictures, the variegated gallery, or the Pocell (pauçetv), or the Painted Gallery (Xronos). A much greater proportion of the picture of the battle of Marathon, in the same gallery, for it is said that he was fined 30 mina, or half a talent, for painting the Barbarians larger than the Greeks, in that picture.

In the battle of the Greeks and Persians, Micon painted the Amazons and Athenians; and opposite to it the battle of the Centaurs and the Lapithae. A third wall also was painted by Micon in this temple, but the picture was so much defaced by time that it has now been entirely effaced, though the fragments remaining do credit to it. Micon also painted, together with Polygnotus, the temple of the Dioscuri; he painted there the return of the Argonauts to Tessalessy with Media and Aetopeneus and Antiope, the daughters of Peleus; they were so called according to this
The following verses are under Mierevelt's portrait in the first edition of Van Mander, which was published during his lifetime:

Plaguedo a. vivum, quo non praestantes alter;
Depresses peritis tauri Mediae Cithara
Principis magalis facit lavatas
et suis praestior

(Van Mander, Het Liv van de Schilders, etc., ed. 1764;
Houbroek, Groote Schouwburg der Nederlandsche Kunstschillers, etc.)

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 eldest masters. He was born at Alessandria in Piedmont, October 15th, 1785, of poor parents, who planned to send him to a carriage-maker, Zuccoli of Milan, to learn wood-carving; but on discovering his strong and peculiar talent, Zuccoli sent him to study architecture and perspective, under Alborelli and Levati, at the academy of the Brera. So prepared, he next studied scene-painting under Galiari, and practised that branch of art—for which Milan was then celebrated beyond any other place in Europe—about eight years, 1792-10, sharing the fame reaped by Galiari, Perego, Landrani, and Sanmicheli. This eminently successful career, one moreover which he pursued with such devotedness, was all at once arrested by a long and dangerous illness, occasioned by a violent exertion of body, 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, insomuch as it compelled him to take a long time to recover, 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 his death the family fortunes were forgotten, he was no longer obtruded upon, 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—whichever he had painted for the theatres. 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 try his hand at monumental scenery in small, and also to combine the dramatic with the scene-painter, peopling his canvass 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 Ileigondus, Adelhade dying in a souterrain of the Trappists, the Consecration of a Temple, the Ducale di la Valliere, and Charles V at a Council. In depicting the personages and manners of material and everyday life, he displayed a vein of strong humour; and his conventionality of persons and refectories, and incidents taken from Porto- dialet poems, remained, in an era of classicism, foreign to the public. Indepently of the figures and stories—the great attraction for the many with which he baited his productions—he converted archetypal pictures into perfect portraits of buildings into real picture, by the united mastery of perspective, chiaroscuri, and colouring. His pictures give the impression and sentiment of the edifices themselves, and are stamped by illustré yet anything but promiscuous 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 1789, 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 very suddenly—in about half an hour after being seized by a violent haemorrhage. His remains were interred in the church of San Marco, was born in 1729, and practised as an artist, in subjects of the same kind as her father. (Giuseppe Sacchi, in Tipaldino's Biografia; Westminster Rev., vol. 15.)

MIAK'NIA, a genus of plants belonging to the natural order Composita, to the suborder Tubiflorae, to the tribe Eupatoriacese, and the subtribe Adenostylceae. It has a shaggy, hoary, hairy, somewhat rough, scabrous, lanceolate, with a little curl at the end and a little bristle; the tube of the corolla short, with the throat dilated and somewhat campanulate; the anthers somewhat protruded; the achenium angular; the pappus in 1 row, rough and hairy.

2Q2
M. officinalis has an erect, smooth, nearly simple stem, with leaves decussating somewhat triangular-ovate, coriaceous with a great sinus, toothed at the sides, entire towards the point, through the epidermis coriaceous and papery. This plant is a native of Brazil, where it is called Corapão de Jeu. It is a handsome plant. The leaves contain a bitter principle and an aromatic spirit, and are used as a medicine and the plants are likewise used in the Cascara and Chinona barks. They are said to be an especially valuable remedy in remitting fevers and in atonic dyspepsia. They are administered in the form of decoction.

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 on the margin above, hairy beneath; the flowers axillary, stalked, opposite; the heads somewhat ternate sessile; the bractlets linear, shorter than the involucres; the involucral scales linear-oblong, obtuse, downy; the anthers smooth. This is one of the plants called Guaco in South America, and is also called the 'pupil.'

M. ulcers, Matico is a remarkable plant; the juice was used in a way that shows its value. The whole plant was excited 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 colombiaca, Dorstenia tubicina, Aristolochia cyanophylla, etc. The guaco has been tried in this country as a remedy in hydrophobia, but without success. The Uruli, or snake-poison of the Indians of British Guiana, is its compound, and contains the same principle. This is C. C. M. opifera is a smooth climbing plant, with an angular stem; it has stalked, cordate, acuminate, repand-toothed or nearly entire leaves, when full grown rather blunt; the heads are sessile, with a calyx of C. C. 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 1813, where it is described as the Epatorium carnatum. The genus Mikania is closely allied to Epatorium, and they belong to a group of plants in the order Compositae, the most remarkable for their activity. Dr. Lindley states, in his 'Vegetable Kingdom,' that the genus is said to produce of Epatorium glutinosum, and not of Arantia elongata, as has been usually supposed. Of this plant Mr. Hartwig says, in a communication to Dr. Lindley, 'Matico is the name applied to the tuber of Eupatorium glutinosum, or the Chusmolena in the Quichua language. It forms a shrub 3-5 feet high, and is common in the higher parts of the Quichuan Andes, where its properties were discovered. It is a tree called Matico (Rutie Mathew), who when wounded in action applied accidentally the leaves of some shrub to his wound, which had the immediate effect of stopping the bleeding and healing the wound. This shrub turned out to be the Chusmolena, which has since been called, in honour of its discoverer, Matico. It is the true Matico of the inhabitants of Quito and Riobamba I have not the slightest doubt; both leaves and specimens have been gathered by myself and my compatriots in this species, and I have no doubt that my examination of the plant found them to agree exactly with his Eupatorium glutinosum.' The Matico has been used in Europe, and is said to be an unusually efficacious and of great value in stopping the bleeding from small wounds. (Poeppig, 'Reise in Chilen, Peru, etc.,' Lindley, 'Vegetable Kingdom; Lindley, 'Flora Medicina.')
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 it was called. For the execution of this sentence the regi-
ments was arrayed as in battle, divided into two lines, furnished with a small stick, generally of oak (except the grenadiers, who used their belts instead of the sticks), the culprit, naked to the waist, was either marched slowly or al-
lone at the head of one line, or he could, on the other, from the head to the rear extremity between the two lines, each man striking him as he passed along. In certain cases the offender was afterwards expelled from the regiment, and sometimes also arrested, with a view 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.

Criminals formerly that soldiers, being goaded to
madness by the pressures exercised on them, either from
caprice or from a mistaken opinion that strictness in the
least details of discipline is as necessary as in points of
their importance, have murdered the officers, when
they considered themselves wronged, and have afterwards, apparently
without regret, suffered death for the crime.

Confinement in a dark room during a certain number of hours
is, a frequent punishment of distinguished offenders, without leave from parents, 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, terms of imprisonment, extra duties, extra fatigue,
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 de-
tection. It might be presumed that acts of treachery will
seldom be committed; but unfortunately desertions to the
enemy frequently take place; the more usual crime is how-
ever of quelling the disorders into which 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 deeds, must, in ordinary times, be treated as traitors. Even
guilty of a minor offence, when the crime is less heinous, the well-being and perhaps
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 death from the loss of numbers of
gallant men in an action, may be the fatal consequences of a
failure, from inebriety, in the delivery of a report or order.

That the trial and, on conviction, the punishment of an
offender do not properly belong to this instance is also evident:
the army may change its position or cantonments, when,
if any delay takes place, it may be impossible for the necessary
witnesses to arrive, or these may in the mean time be re-
moved by a change of quarter. A serious fault in a uniform line
between the commission of a crime and its punishment diminishes the fear
of the latter by opening to the culprit another chance of escape; it moreover diminishes the effect of the punishment as a correction for evil future behaviour, and accordingly
was, off, and the punishment assumes, in some measure, the ap-
pearance of an act of cruelty.

The circumstances of an army in a time of peace and in a
time of war, or even the men in the presence of an enemy, are
very different: in the former case soldiers have no oppor-
tunity to commit treason or to pillage a country; and since
the generality of the men who then enter the army are such
as have a fair moral character, great crimes among them are
as unfrequent as they are among an equal number of men in
any other condition of life: the punishments for such offences
as may be committed are, in double time, greater; the same
prophecy is of the same nature and degree as much which was
drawn from the commission of a crime and its punishment
concerning the peculiarity of the crimes; for it may be
judged for corresponding offences by the ordinary courts of
justice. Imprisonment for a time, employment in laborious
tasks, but particularly a forfeiture of personal privileges, where
the offender is without a family depending on his for
wages, might, probably with advantage, be made the punishment for
military offences.

The usual sentence now for breaches of discipline is that
a certain number of lashes be inflicted on cords on the naked
back of the offender: this kind of punishment is both cruel
and disgusting; and, which is worse, it leaves on the skin
during life the emblem of disgrace which, if discovered by any
accident, cannot fail to produce a prejudice against the in-
dividual, how well soever he may have conducted himself sub-
sequently to the infliction. It falls, moreover, with unequal
effect on different persons according to their state of their
health, or of their nervous systems at the time; and not un-
frequently, according to the will of the person who adminis-
ters or who superintends the punishment. It may be said
that many of these officers who are drenched in their
minutest caprice, without a moment's regret, are, at the
same moment, neither avoid sympathizing with the culprit nor becoming
dissatisfied with a service in which they are exposed to such
disgrace and suffering.

The disadvantages under which, during his whole life, an
individual may labour who has once suffered the punishment
of being flogged, are strikingly related in General Sir Charles
Napier's Remarks on Military Law,' p. 158, &c. This dis-
advantage is of different kinds, each of which is visited
only in a degree suited to the crime, and when circum-
stances prevent a different kind of punishment from being
used, may occasionally be effectual; but he gives cogent rea-
sons for considering it to be both wise and humane that the
number of lashes which a court-martial was formerly allowed
25, to prescribe is now diminished, and for abolishing the punish-
ment entirely in times of peace.

Sir Charles Napier has said; that, and forty years before the time
at which he wrote (1837), he frequently saw from 600 to
1000 lashes inflicted in consequence of sentences of merely
regimental courts-martial; and in those days a man who had
suffered a part of the punishment was often brought from
an hospital when the wounds were barely healed, to receive the
remainder. At present even a general court-martial cannot
sentence a man to receive more than 200 lashes. The of-
ference of inducing a soldier to desert, in which case was
visited with 1000 lashes, is, according to the present military
law, punishable only by 'fine or imprisonment, or both, as
the court shall adjudge.'

With respect to the effects of the law in its actual state, it
may be observed that the discipline of the British army,
during the time that it served in Spain and France, is ac-
nowledged to have been more perfect than it had been in
any former times. But it may be said, however, that the use of the lash be
only gradually abolished; the milder punishments being substituted as often as possible.

The practice of giving rewards for good behaviour, now so
happily introduced in the military service, and the instruction
obtained at the regimental schools, will in time, it is hoped,
operate a beneficial change in the characters of such men as
have not, from nature or from early education, a just sense
of moral rectitude and of the obligations all are under of pun-
tually and faithfully discharging the duties they owe to their
country. It is indeed probable that such means will entirely
supersede the necessity of a punishment which degrades a
brave soldier by placing him below the level of a brute.

MILITARY TENURES. [FEUDAL SYSTEM, P. C.]

MILLIUM, a genus of grasses belonging to the tribe
Agrostidiace. It has membranous glumes, nearly equal,
armed; the lemma 2, nearly equal, unarticulated, as the
glumes, and hardening on the fruit; the spikelet convex on
the back, or slightly dorsally compressed. There is but
one British species of this genus, the bent grass, an
acuminated, linear-lanceolate leaves. It has a stem 3 or 4 feet in height, and is
found in damp shady woods.

(Balington, 350; see British Botany.)

MILL, MILLWORK. [Wheel, P. C., p. 810; Wind-
mill, P. C., p. 445; Windlass, P. C., p. 450; Coupling
P. C., p. 483; Gear, P. C., S., p. 648.]
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 every species of the ancient collections, and the 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 which he might have the opportunity of suffering as an artist, 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 had more than one friend in the army, and it seemed best to delay the boy's departure for a time. To avoid the dangers of the times, he made a journey to Paris, where he associated with the most celebrated writers on antiquities, and from his conversation there, he became acquainted with the most celebrated writers of France. He spent some time at Paris, and was then sent to the University of Paris, where he continued his studies for some time. In 1822, he was received as a member of the American Philosophical Society, and in 1837, he was elected a member of the Royal Society of London. (Classical Museum, part x, 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 notice. In various treaties on mineralogy there will be found descriptions of some bodies which we have 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 under 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.

ARSENITE. (Filippetti, P. C.)

ARSENITE. (Bichat, A. M. C.)

ARSENITE. (Titanium, F. C.)

AGATEM. (Zeolite, P. C.)

ALUMINA. (C. L. D.)

ALUMINA. (Websterite, Subm. Alumina) occurs in reinforn masses and botryoidal concretions. Colour white or yellowish white. Stearum white. Fracture earthy, Soft, transparent. Translucent. Specific gravity 1.06. Found at Sarajevo in Bosnia, and near Calabia in Calabria. Analysis:—Sulphuric acid, 36.4; alumina, 16; water, 40.6; peroxide of iron, 0.4. Dr. Thomson's analysis gives 28.6.

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AMPHIBOL. (Augite, P. C.)

AMPHIBOL. (Lecite, P. C.)

AMPHIBOL. (Travertine, P. C.)


ANDALUSITE (Amphibolite Sulphate of Lime) occurs massive and crystallized. Primary form a right rhombic prism. Cleavage very distinct parallel to the terminal planes and their two diagonals; parallel to the lateral planes indistinct.
Fracture uneven. Colour white, bluish, violet or reddish. Lustre vitreous, peary on the cleavage surfaces. Hardness 3 to 3½. Transparent, translucent. Refraction double. Specific gravity 2½ to 2½. Massive varieties among, andalusite, nodular, reniform. Found at Haile in the Tyrol, Ben in Switzerland, and in the salt-mines of Upper Austria and Salzburg, &c. Analysis of a specimen from Sulz:- Sulphuric acid, 57; lime, 42; silica, 2.

ANALKERITE occurs crystallised. Primary form a rhomboid. Cleavage parallel to the prismatic plane. Colour yellow, sometimes yellowish or brownish from an admixture of oxide of iron. Fracture uneven. Hardness 3½ to 4. Lustre vitreous, translucent. Specific gravity 2½. Found at Salzburg and in the Alps, &c. Analysis, by Berchier:- Carbonate of lime, 51½; carbonate of magnesia, 25½; carbonate of iron, 20½; carbonate of manganese, 30%.


ANTIMONITE. [Zoelites, P. C.]

ARAWEIDONITE occurs amorphous. Cleavage parallel to the lateral planes and both the diagonals of a rhomboid prism. Colour olivaceous. Hardness 0½. Lustre vitreous. Opalescent opaline. Specific gravity 3½ to 3. Found in Norway and Greenland. Analysis, by Dr. Thomson: Silica, 50½; protode of iron, 35½; sesqui-oxide of magnesia, 8½; soda, 1½; lime, 5½; water, 13; Specific gravity 0½; found in the Bed of the Morice, near Kiel in Holstein, Kongsberg, and in the salt-mines of Upper Austria and Salzburg, &c. Analysis of a specimen from Sulz:- Sulphuric acid, 57; lime, 42; silica, 2.

ATAZAMITE (Chlorochlzoide of Copper, Muriate of Copper) occurs massive, pulverulent, and crystallized. Primary form a right rhombic prism. Colour green of various shades, but chiefly emerald green. Lustre strong. Fracture uneven. Hardness 3½ to 6. Lustre vitreous. Translucent to opaque. Specific gravity 4½. Found at Remolassa in Chile, and the pulverulent variety at Atacama in Peru. Massive variety零售, with a fibrous structure. Analysis, by Proest: Muriatic acid, 10½; oxide of copper, 76½; water, 12½.


AUTOMALITE. [GARRETT, P. C.]

BARCHEUITE occurs amorphous, and granular distinct concretions. Colour yellow-green. Lustre vitreous. Translucent. Specific gravity 3½. Found at Arendal in Norway, the Shetland Islands, and United States at Charlestown, Mass. Analysis, by Arpke, of a specimen from Arendal: Silica, 54½; carbonate of iron, 21½; lime, 19½; magnesia, 2½; protode of manganese, 1½; alumina, 0½; volatile matter, 0½.

BALTIMOITE is composed of longitudinal fibres adhering to each other. Lustre silky. opaque, but in thin pieces translucent on the edges. Hardness less than that of calcareous spar. Found at Baltimore, U.S. Analysis, by Dr. Thomson: Silica, 40½; magnesia, 34½; protode of iron, 10½; alumina, 1½; water, 12½.


BARTONSTROMHITE. [STROMMEN, P. C.]

BAROCHNITE occurs in amorphous, or amorphous 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 Chelles in
M I N

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M I N

An. Analysis, by Kohler: Silica, 57.19; magnesia, 82.57; lime, 1.29; protodote of iron, 7.46.

Brookite. [TITANIUM, P.C.]

Brochite. [MACABREIT, P.C.]


Boskervreuz. [COFFER, Purple, P.C.]

Boskervreuzite occurs in irregularly disposed prismatic crystals, having a characteristic structure, brown, grey, green, or reddish colour. Nearly opaque. Hardness 6-6 to 7-0. Lustre somewhat silky. Specific gravity 3.1 to 3.23. Found at Real de Minas in Mexico. Analysis, by Dumas: silica, 49.90; protodote of magnesium, 36.06; lime, 14.57; protodote of iron, 0.81.

Cacholong. [OPAL, P.C.]

Cadmium. Sulphate of. [GERSOYKITE]

Cadm睚onite occurs crystallized. Primary form a rhombic prism. Cleavage parallel to the primary faces, and to the short diagonal of the prism. Colour blue and greenish blue; streak bluish or greenish white. Fracture uneven. Hardness 2-5 to 3-0. Lustre resinous to resinous. Translucent, transparent. Specific gravity 6.2. Found at Lead Hills in Scotland. Analysis, by Brooke: Carbonate of lead, 32.8; carbonate of copper, 11.4; sulphate of lead, 56.8.

Carnegie. [RHYOLITE, P.C.]

Carnihite. [LEAD, P.C.]

Chabazit. [ZEOCLITE, P.C.]

Chalcolite. [URANIUM, P.C.]

Chabazitite. [P.C.]

Chalcedony occurs crystallized. Primary form a rhombic prism. Cleavage in planes parallel to the axis. Colour yellow, brownish yellow; streak white. Fracture uneven. Hardness 2-5 to 3-0. Lustre resinous or inclining to resinous. Transparent, translucent. Found near Tavistock, Devonshire, and at Crinnis, Cornwall. Analysis: Wollaston has shown it to be composed of phosphoric acid, alumina, and iron. The hardness has not been determined.

Chlorite. [TALC, P.C.]

Chloropoc occurs massive, amorphous. Fracture concrete, compact and splintery. Colour green, sometimes reddish brown. Structure compact, sometimes earthy. Hardness 3-0 to 4-0. Lustre of the compact, dull resinous. Opake. Specific gravity 1.7 to 2.0. Found near Ungurh in Hungary. Analysis, by Brandes: silica, 46.0; oxide of iron, 38.3; magnesia, 2.0; alumina, 1.9; magnesia, a trace; water, 18.0.

Chlorophyllite. (Hydrous Jolite) occurs crystallized in six-sided prisms, the edges of which are usually replaced by so many planes that the crystals appear almost cylindrical. Colour grey; fracture compact. Hardness 2-5. Colour green, greenish brown or dark olive-brown. Translucent. Specific gravity 2.705. Found in the Alps, Aosta, and also at Unity, N. H., in the United States. Analysis, by Bondorf, of the mineral from Abo: Silica, 45.05; alumina, 30.05; magnesia, 9.00; protodote of iron, 5.30; water, 10.00.

Chlorinitite occurs rounded in masses. Is not cleavable. Fracture uneven and imperfectly conchoidal. Colour white, with shades of yellow and grey. Hardness between 2-0 and 4-0. Lustre glimmering or dull. Transparent, often only on the edges. Found at Elba. Analysis, by Von Kobell: Silica, 36.99; alumina, 17.12; magnesia, 32.90; lime, 12.00; protodote of iron, 1.46; water, 9.00.

Chlorocolla occurs massive. Sometimes in pseudo-massive beds, botryoidal and reniform. No cleavage observable. Colour bluish and blackish-green; streak green. Fracture earthy or conchoidal. Hardness 2-0 to 8-0. Lustre vitreous-opalescent. Translucent. Opake. Specific gravity 2.031. Found at La Granja del Prado, in Hungary. Art. Analysis, by Kobell: Silica, 36.44; oxide of copper, 40.00; water, 26.20; iron, 1.00. It is more than probable, as shown by analysis, that calcite and quartz, merely coloured by copper, have been converted into chlorocolla.

Cinnabarrine. [GANET, P.C.]

Cleavage. [LILACITE, Albitte]

Cleavage occurs massive and crystallized. Primary form a doubly oblique prism. Cleavage parallel to the plane of the colour, sometimes yellowish or reddish green, bluish, or red; streak white. Fracture uneven. Hardness 6-0. Lustre pearly on the cleavage planes, vitreous in other directions. Transparent, translucent. Specific gravity 2.6 to 3.88. The massive varieties have a lustrous structure. Found in Norway, Sweden, Dauphiny, St. Gothard, and Scotland, and accompanying felspar in most of its numerous localities; from this it differs chiefly in containing soda instead of potash; obtained near St. Gothard. In the Rhine. It does not appear to have been analysed.

Clintonianes (Seybertite, Xanochiphylite Holme) occurs crystallized, and in imperfectly crystallized masses. Primary form a rhombic prism. Colour greenish, red, or reddish brown, yellowish brown, and red; streak yellowish grey. Hardness 4-5. Lustre metallic and metallic pearly. Translucent to opake. In thin laminae sometimes a slight prismatic gravity 3.08. Found at Amity, Orange Co., N. Y. Analysis, by Clemson: Silica, 17.0; alumina, 37.6; magnesia, 24.3; lime, 10.7; protodote of iron, 4.0; water, 3.6.


Copper. [PHOSPHENE, P.C.]

Compositite. [ZEOCLITE, P.C.]

Condorite. [Macabrite, P.C.]


Conquimite. (Sulphated Periclase of Iron) occurs in granular masses, some parts of which are crystallized. The crystals are regular hexagonal prisms, terminated by six-sided pyramidal ends. Embryonic soda in water. Colour white, and also of various shades of brown, yellow, red, and sometimes even of a deep blue colour. Found in the southern part of Peru near Calama in Bolivia, and near Copiapo in Chili. Analysis, by Rose: Si, 51.52; lime, 43.54; water, 24.91; alumina, 0.78; lime, 0.14; magnesia, 0.21; silica, 0.37; water, 9.28.


Cristobalite. [TITANIUM, P.C.]

Cronstedtite. (Hydrous Silicate of Iron) occurs massive and crystallized. Primary form a rhomboid; in small, thin, hexagonal prisms, and in radiating laminae parallel to the axis distinct. Colour black and brownish black; streak dull green. Hardness 2-0 to 2-5. Lustre vitreous.Opaque. Specific gravity 3-3 to 3-8. Found in Cornwall, Brazil, and Prussia in Bohemia. Analysis, by Steinmann: Silica, 22.45; oxide of iron, 58.85; oxide of manganese, 2.89; magnesia, 5.08; water, 10.70.

Cure Ores. [PHARMAKOGRITHE.]

Cummingtonite. [AGOPITE, P.C.]

Cynophane. [Chemodite, P.C.]

Danaites (Arsenical Sulphate of Iron and Cobalt) occurs crystallized. Primary form a right rhombic prism. Colour brown with a tinge of steel grey; streak dark greyish black. Fracture uneven. Brittle. Hardness 6-5 to 6-0. Lustre metallic. Specific gravity 6-127. Found at Franconia, N. H., at Jackson, N. H., and other places in the United States. Analysis, by Faraday: Sulphur, 17.56; arsenic, 41.44; iron, 32.94; cobalt, 0.45.

Danburite occurs crystallized. Primary form an oblique rhombic prism. Colour honey-yellow, becoming nearly white by decomposition. Fracture steely grey; streak dark greyish black. Hardness 6-6 to 6-0. Lustre vitreous. Translucent, transparent. Specific gravity 2-88. Found at Danbury, Ct. Analysis, by Shepard: Silica, 5.6; lime, 28.35; alumina, 1.70; yttria, 0.85; potass, soda, and loss, 51.90; water, 4.09.

Davyite occurs crystallized. Primary form a rhomboid. Cleavage parallel to the planes of the hexagonal prism. Colour white, sometimes yellowish brown; streak white.
Fracture conchoideal. Hardness 6 to 6.5. Lustre vitreous. Transparent, translucent, opake. Specific gravity 2.4. Found in Pegmatite rocks of New Brunswick. Analysis, by Covell: Silica, 42.97; Alumina, 23.29; magnesia, 12.95; peroxide of iron, 1.25; water, 7.43; loss, 3.11.

Dermatococc occurs in reniform masses, rarely globular, and also in thick lamellar, encrusting, or brown or liver brown. Streak yellow inclining to grey. Fracture conchoideal.Feels greasy, but does not adhere to the tongue. Hardness about 2. Lustre somewhat renisous. Specific gravity 2.15. Found in the Agapite quarry near Wathem in Saxony. Analysis, by Felius: Silica, 35.60; magnesia, 23.70; peroxide of iron, 11.33; proteide of manganese, 2.25; alumina, 0.416; lime, 0.833; water and calcined matter, 32.29.

Dialase. [Adote, P. C.]

Dissaper 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 Kossobud in the Orenburg government of Asiatic Russia. Massive variety occurs in slightly curvilinear lamina of a shining pearly lustre and greenish-grey colour; also in cellular masses, constituted of slender crystals, which have a pearly lustre and intercept each other in every direction; of a brown hue externally, but perfectly transparent and colourless when reduced to thin leaves. Colour brown. Hardness 5.1 to 6.3; 14.46. The brown variety, analyzed by Children, gave—alumina, 76.06; water, 14.70; oxide of iron, 7.78; loss, 1.46.


Dyselite occurs in small radiated masses. Colour olive or dull green. Slightly translucent and extremely fusible. Specific gravity 3.27. Found at Anglar, near Limoges. Analysis, by Dr. Thompson: Sulphate of iron, 25.4; of manganese, 51.69; of lime, 16.80; of oxide of iron, 41.93; of proteide of manganese, 7.60; of Silica, 2.956; moisture, 0.60. Dyselite occurs crystallized in regular octohedrons. Cleavage rather imperfect, parallel with the faces of the crystal. Colour white or greyish brown. Hardness 4.5. Fracture conchoideal. Hardness 6.5. Somewhat translucent, opake. Lustre vitreous, inclining to resinous. Specific gravity 4.651. Found at Sterling, New Jersey. Analysis, by Dr. Thomson: Alumina, 50.40; oxide of iron, 16.80; of oxide of iron, 41.934; of proteide of manganese, 7.60; of Silica, 2.956; moisture, 0.60.

Eliolait. Occurs fibrous or feathery and massive. Colour white or greyish brown. Hardness 4.5 to 5. Found at Alladell in Smalld, Cizlulow in the Banate, and in Norway. Analysis, Silica, 61.85; lime, 39.15; with small quantities of magnesia, alumina, and iron. Another compound under this name has also been called the Alladell red zelote. It agrees in composition with stilbite, except that it contains two cent. less of water.

Eschobro [Sulfite] does not occur crystallized, but in compact or finely fibrous masses, and occasionally in thin lamina. Colour green, grey, or brownish. Lustre vitreous or resinous. Transparent. Analysis, by Ekeberg: Silica, 46.59; lime, 39.8; soda, 5.8; oxide of iron, 0.75; water, 2.25.

Echolatte (Fattelein) occurs in amorphous masses, with cleavages parallel to the lateral planes, and both diagonals of a rhombic prism. Structure conchoideal.Colour dark green, bluish grey, or greyish or brownish red. Hardness 5 to 6. Lustre resinous, frequently opalescent when cut. Transparent. Specific gravity 2.54 to 2.93. It is found at Lord, Stain, and Brecknock in the Yorkshire. Analysis, by Vauquelin: Silica, 44.00; alumina, 34.00; soda, 16.50; peroxide of iron, 4.00; lime, 0.12. Gmelin found also 4.73% of peroxide of iron, 0.08.

Electrite. [Gold, Allote, P. C.]


Epromite (Sulphate of Magnesia) occurs massive, botryoidal, and reniform, on the surface of other bodies, and in solution in sea and mineral waters. Colour white. Streak white. Structure fibrous, sometimes earthy. Brittle. Taste bitter and saline. Found originally in a spring at Epeom. It forms a large bed near Arequipa in Peru, and is often in fine crystals and silky fibres.

Erinite (Arsenate of Copper) occurs in concentric and mammillated layers, between which other arseniates are found. The layers have rough surfaces and a fibrous structure. Colour brown, grey. Hardness 5 to 6. Streak pale. Fracture uneven or imperfect conchoideal. Hardness 4.5 to 5. Lustre slightly resinous. Slightly translucent. Specific gravity 4.0 to 4.1. Found near Limerock. Analysis, by Turner: Arsenic acid, 59.87; oxide of copper, 50.44; alumina, 1.77; water, 5.01.

Erinite. [Zeolites, P. C.]

Esklitui occurs massive and amorphous. Fracture in some specimens foliated, in others splintery. Structure granular, compact. Colour light greenish grey. Hardness 7 to 7.5. Lustre vitreous, shining. Hardness 6.25 to 7.0. Lustre feebly shining, or dull. Opake. Specific gravity 3.5 to 3.1. Found near Erd in the Saxon, England, growing on a bed of 100 fathoms in thickness. Analysis, by Gneisii: Silica, 53.16; alumina, 14.03; lime, 14.39; magnesia, 5.2; soda, 2.61; oxide of iron, 7.14; oxide of manganese, 0.64; water, 0.60.

Eusechroite (Arunate of Copper) occurs crystallized. Primary form a right rhombic prism. Cleavage indistinct, Colour bright emerald green. Streak pale apple green. Fracture uneven. Hardness 3.5 to 4.0. Lustre vitreous. Refraction double. Transparent, translucent. Specific gravity 3.38 to 3.41. Found at Libethen in Hungary. Analysis, by Turner: Arsenic acid, 53.26; oxide of copper, 47.05; water, 18.90.

Esstrukte occurs massive without any trace of cleavage. Colour brownish black. In thin splinters has a reddish brown transluence, lighter than the streak. Streak reddish brown. Fracture subconchoidal. Hardness, scratches thiorie. Lustre metallic, greyish brown. Hardness 4 to 4.3. Found in Norway. Analysis, by Scherer: Columbic acid, with some tin acid, 46.96; tin acid, 7.94; yttria, 25.06; proteide of uranium, 0.84; proteide of cerium, 2.18; oxide of lanthanum, 0.96; lime, 2.47; magnesia, 0.25; water, 3.97=9.30.

Faimake. [Pyrroxyne, P. C.]

Faizalite occurs crystallized in the form of an octahedron with a square base. Colour white, sometimes brown. Fracture vitreous or uneven. Fragile. Lustre brilliant. Found at Kalashatur in Bresigum. Analysis, by Daurou: Silica, 49.36; alumina, 18.77; lime, 5.00; soda, 4.34; water, 22.49.

Fibrolite. [Kyanite, P. C.]


Gadolinite. [Ythrium, P. C.]

Gedrite occurs in crystalline masses, having a fibrous, radiated, or lamellar structure. Colour close brown. Streak grey or yellowish. Lustre submetallic, feeble. Hardness not above 5.0. Rough. Specific gravity 3.26. Occurs in loose stones near Gedre in the Pyrenees. It has some resemblance to a hyaline. Analysis, by Goni: Silica, 38.811; alumina, 9.309; proteide of iron, 46.35; magnesia, 4.130; lime, 0.686; water, 2.301.

Gekrozerite (Kilbridecaseite) occurs amorphous without cleavage. Fracture lamellar in one direction, and in the other...

Gloablite occurs crystallized in six- and twelve-sided prisms. Cleavage parallel to the six sides of the prism. Colour greenish to dark steel grey. Lustre between vitreous and waxy. Hardness about 3-5. Specific gravity 2-662 to 2-673. Found near Temnella in Finland. Analysis, by Wachtmeister: Silica, 46-27; alumina, 25-10; peroxide of iron, 15-60; magnesium, 3-80; proteoxide of manganese, 0-90; potash, 2-70; soda, 3-20; water, 4-5; ammonia, 0-80.


Gmelinite. [Zeolites, P. C.]

Gondalite. [Lead, Ores of P. C.]

Green Iron Earth (Hydrochlorite) occurs in reiform, botryoidal, and globular masses. Colour green, passing into black and yellow. Lustre resinous and dull. Brittle. Found at Selmouth in Saxony. Analysis by Muller: Silica, 56-17; oxide of bismuth, 15-05; alumina, 14-65; oxide of iron, 10-54; phosphoric acid with traces of manganous, 5-62.


Greenstone occurs in small amorphous crystalline masses. Primary form a doubly oblique prism. Colour deep rose-red. Hardness greater than that of flint spar; does not scratch glass. Some of the faces are brilliant, others often dull and tarnished. Specific gravity 3-44. Found at St. Marcel in Piedmont. Analysis, by M. Delasse: Silica, 50-40; oxide of iron, 34-30; peroxide of iron, 15-95; proteoxide of manganese, 9-62.


Greenstone occurs in small amorphous crystalline masses. Primary form a doubly oblique prism. Colour deep rose-red. Hardness greater than that of flint spar; does not scratch glass. Some of the faces are brilliant, others often dull and tarnished. Specific gravity 3-44. Found at St. Marcel in Piedmont. Analysis, by M. Delasse: Silica, 50-40; oxide of iron, 34-30; peroxide of iron, 15-95; proteoxide of manganese, 9-62.


Greenstein. [Zeolites, P. C.]

Gondalite. [Lead, Ores of P. C.]

Green Iron Earth (Hydrochlorite) occurs in reiform, botryoidal, and globular masses. Colour green, passing into black and yellow. Lustre resinous and dull. Brittle. Found at Selmouth in Saxony. Analysis by Muller: Silica, 56-17; oxide of bismuth, 15-05; alumina, 14-65; oxide of iron, 10-54; phosphoric acid with traces of manganous, 5-62.

brilliant. Structure radiated, crystalline. Streuk and powdery black. Specific gravity 6'29 to 6'32. Found in the coalmines at Hacena in Sweden. Analysis by Setterberg: Sulphuret of lead, 40'36; sulphate of bismuth, 39'18; sulphuret of molybdenum, 12'78; iron, 7'42; sulphate of copper, 1'08; guine, 1'45 to 1'99.

**KOLBITTE (Hydrous Silicate of Alumina)** occurs massive, Colour white. Fracture earthy. Nearly opaque. Lustre submetallic, earthy, with a greenish tinge. Translucent. Perfect cleavage parallel to the faces of the rhomb; generally in small aggregated and diverging fibrous groups of a pale apple green or verdigris-green colour. Streuk paler. Hardness 1 to 2. Translucent. Fracture perfect. Parallel. Emery, amber, opal. Occurs in the Thuringian Forest. Found at Amsdenburg in Thuringia, and also in the volcanic rocks of Vestaul, in black or greenish blue in crustations. Analysis, by Wallencher: Sulphate of copper, 64'64; copper, 64'77; iron, 0'46; lead, 1'04.

**KAFFERSCHAUM** occurs crystallized. Primary form a right rhombic prism. Secondary form a compact, glassy, transparent, perfect cleavage parallel to the faces of the rhomb; generally in small aggregated and diverging fibrous groups of a pale apple green or verdigris-green colour. Streuk paler. Hardness 1 to 2. Translucent. Fracture perfect. Parallel. Emery, amber, opal. Occurs in the Thuringian Forest. Found at Amsdenburg in Thuringia, and also in the volcanic rocks of Vestaul, in black or greenish blue in crustations. Analysis, by wallercher: Sulphate of copper, 64'64; copper, 64'77; iron, 0'46; lead, 1'04.

**LAMARRITE (Sulphate-carbonate of Lead)** occurs in large crystal masses, often in compact, grey, red or pink. Fracture uneven. Hardness 5'5 to 6'0. Lustre vitreous. Translucent. Specific gravity 3'58 to 3'60. Occurs in Cornwall, England. Analysis, by c. H. Ehrenfried, in Finnand. Analysis, by Gymnich: Sulphate of copper, 44'65; alumina, 38'81; lime, 9'29; potash, 6'58; oxide of manganese, 3'16.

**LAVENDERITE** occurs amorphous. Colour lavender blue. Structure fine parallel fibrous. Streak pale bluish green; luster, earthy; hardness 2-5 to 3-0. Occurs at Annaberg in Saxony, with cobalt and iron ores. Analysis: According to Plattner, it contains arsenic, and the oxides of cobalt, copper and nickel, and water.


Lenzite usually forms a variety of the above, its colour being bluish and greyish white.

**LEONARDOSCHEN** occurs crystallized. Primary form an oblique rhombic prism. Cleavage very perfect, parallel to the lateral planes. Strongly colored. Colour bluish white. Fracture uneven. Found at Wolfstein in Rhenish Bavaria. Analysis, by Dr. Delf: Silica, 50'128; alumina, 22'980; lime, 0'261; water and loss, 11'641.

**LEOBERTIT** occurs in large but not perfectly developed crystals in the form of the rhomboid. Colour yellowish in masses, but in thin lamina white. Texture lamellar. Lustre pearly. Transparent in small crystals. Hardness between calcareous and talc. Streak grey. Specific gravity 2'71. Found in the Schiebelmühlen mines in the district of Slaton. Analysis, by Kornmuller: Silica, 34'23; alumina, 16'81; magnesia, 35'60; potezide of iron, 3'38; lime, 9'56; water, 19'86.

**LIEPHDIT** occurs in four-sided prisms, but is seldom regularly crystallized. Cleavage imperfect in three directions. Colour pale dirty green and deep wine yellow. Translucent and transparent. Fracture perfect. Colour develops on cleavage surface. Hardness 5'50 to 6'7. Specific gravity 2'974. Found at Langeland in Norway. Analysis, by J. E. M. J. A. Lund: Silica, 47'82; calcium, 11'51; lime, 25'00; ferric, 6'17; sodium, 7'65; potazide of manganese, 1'01; potassium, 0'26.


**LUGITE** Primary form an oblique rhombic prism. Colour apple green. Streuk greyish green. Fracture uneven. Hardness above 5'5. Lustre of the surface of fracture, between vitreous and resinous. Fracture imperfect. Specific gravity 3'49. Found on the banks of the Stura, in the Apennines of Liguria. Analysis, by J. E. M. J. A. Lund: Silica, 57'45; alumina, 7'86; iron, 20'6; potazide of magnesium, 11'56; oxides of iron, 3'00; oxide of manganese, 0'5 = 56'17.

**LUMB, OXALATE OF** occurs crystallized. Primary form an oblique rhombic prism. Colour deep amarue blue. Streak pale blue. Fracture uneven. Hardness 2'5 to 3'0. Lustre vitreous or adamantine. Transparent, translucent. Specific gravity 3'5 to 5'4. Found at Linares in Swain, and at Lead Hills, Scotland. Analysis, by Brook: Sulphate of lead, 74'4; oxide of copper, 18'00; water, 25'00. Analysis, by J. E. M. J. A. Lund:

**LUNENBURG** Primary form a right rhombic prism, occurs in octahedral crystals. Cleavage parallel to the primary planes. Colour light blue and occasionally dull green. Streuk in various directions. Hardness 2 to 2'5. Transparent, translucent. Specific gravity 2'926. Found near Redveth, Cornwall, and in Hungary. Analysis, by Dr. J. E. M. J. A. Lund: Arsenic acid, 43'89; oxide of copper, 30'10; water, 26'03.

**LITHOMORCHE** occurs massive. Spheroideal. Colour white, grey, red, yellow, blue. Streuk shining. Structure compact. Soft. Dull. Opaque. Utenous to the touch. Adheres to the tongue. Specific gravity 2'2 to 2'5. Found in Cornwall near Redruth, in Saxon and some other places in Europe. Friable Lithomorche occurs in scaly, glimmering particles, which are phosphorescent in the dark. Found at Ehrenfried-derdendorf in Saxony, by Klaproth: Silica, 32'00; alumina, 26'50; oxide of iron, 21'00; chloride of sodium, 1'50; water, 17'00.

**MAGNIES** ALUM occurs massive. Structure fibrous, also compact. Colour white. Streuk snow white. Fracture uneven. Found at Cape Verde, in Southern Africa, where it covers the floor of a grotto to the depth of six inches. Analysis, by J. E. M. J. A. Lund: Sulphate of alumina, 38'998; sulphate of magnesia, 10'890; chloride of magnesium, 4'927; chloride of potassium, 0'025; water, 45'780.

**MAGNIES, HYDRE OF.** (Sheppard.)

**MAGNIES, FRASMCOLITE occurs massive. Cleavage foliaceous. Colour brown, transparent. Found in one listed in a directory of brown clay. Streuk pale brown and grey. Streuk white. Fracture uneven. Frequently coated with brownish or black powder. Hardness 3'0 to 3'5. Lustre pearly, especially on perfect cleavage planes; on the fracture surface, vitreous. Colour varies from iron to yellowish brown. Specific gravity 2'25. Found near Wolfsstein in Rhenish Bavaria. Analysis, by Dr. Delf: Silica, 50'128; alumina, 22'980; lime, 0'261; water and loss, 11'641.
Lustre generally terminated by lanthanum, consists of the protoxide of oxygen, magnesia, water, sulphuric acid, chalk, and sometimes perpendicularly to the axis. Fracture not observable. Hardness of the cleavage surfaces 2-0 to 2-5, that of the edges 4-5 to 5-5.

**Rhomboedral Mica**. Primary form an oblique rhombic prism, according to Breseke the preceding descriptions will probably apply to this variety, except as to the form.

**Oblique Prismatic Mica**. Primary form an oblique rhombic prism, and according to Breseke the preceding descriptions will probably apply to this variety, except as to the form.

**Magnetite**. Primary form a rhombic prism, sometimes tetragonal, perpendicularly to the axis. Fracture not observable. Hardness of the cleavage surfaces 2-0 to 2-5, that of the edges 4-5 to 5-5.

**Middletonite**. Occurs in rounded masses, seldom larger than a meter in diameter, and usually in a mass of thin shining laminae. Primary form a rhombic prism, showing a bright red colour by transmitted light. Fracture parallel to the axis.

**Monadrite**. Occurs massive. Fracture, one distinct, and another imperfect. Colour pale yellowish, verging on red. Hardness nearly that of felspar. Lustre vitreous. Specific gravity 2-98. Found at Bergen, in Norway. Analysed by Erdmann: Silica, 56-17; magnetite, 31-82; protoxide of iron, 8-66; water, 4-04.

**Monticellite**. Occurs crystallized. Primary form a right rhombic prism. Cristalline, and have usually the aspect of quartz. Colour generally yellowish. No cleavage planes have been observed. Hardness 5-0 to 6-0. Sometimes nearly transparent and colourless. Found at Venustia. It has not been analysed.

**Monambrites**. Occurs massive and fibrous, and crystallized in flat prisms. Cleavage in one direction distinct, in others indistinct. Colour dull reddish-brown. Lustre greyish brown. Hardness 4-0. 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 Lammansker in Sweden. Analysis: according to Erdmann. It contains about 10-0 per cent. of silica, titanic acid, and the oxides of iron and lanthanum, with some oxide of manganese, lime, a little magnesia, potash, and water.

**Nickel Oxide**. 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 blackish lead-grey, soon acquiring a yellowish or olive-green tinge. Lustre dull to resinous, with a shining metallic lustre. Hardness 2-0 to 2-5.Opaque. Specific gravity 6-15. Found near Ekaterinburg in Siberia. Analysis, by Frick: Sulphate, 11-58; bismuth, 43-20; copper, 12-10; nickel, 1-68; tellurium, 1-32.

**Nephelite**. Occurs in crystals, which are elastic, sometimes curved, and easily separated. Colour white, with a shade of yellow. Lustre white. Lustre highly silky. Opaque. Some decomposed varieties have an earthy appearance. Hardness 2-0. Specific gravity 2-535. Found in veins at Hoboken, New Jersey, and other places in the United States. Analysis, by Dr. Thomson: Silica, 56-568; magnesia, 51-721; peroxide of iron, 5-874; water, 20-696.

**Numerolite**. Occurs in crystals, which are almost lenticular. Primary form a rhomboid. It is generally found implanted in mammillated masses. Colour yellow, greyish or greenish. Lustre white, yellowish white or greenish. Fracture somewhat conchoidal. Hardness 4-0. Lustre greasy, feeble. Specific gravity 4-0415. Found in the mines of Nysse, near Bingen, departmen of Bavaria. Analysed by Rhine, Frieden: Lubricity of lead, 50-50; phosphate of lime, 22-95; chlorite of lead, 7-56; arsenide of iron, 6-50.

**Oberhutite**. Occurs crystallized. Primary form a right square prism. Cristalline, and have usually the aspect of quartz. Colour generally yellowish. No cleavage planes have been observed. Hardness 6-5. Specific gravity 2-68. Found at Arendal, Norway. Analysis: Titanate of zirconia, 68-956; silica, 19-708; lime, 2-612; magnesia, 2-047; protoxide of iron, 1-136; water, 5-332.
Oxide (Dycodite) occurs in fibrous masses, having a radiated structure; also imperfectly fibrous, or composed of minute crystals. Hardness 4.5 to 5. Colour white. Specific gravity 2.28. Translucent. Exhibits double refraction. Found at Bobile: Silica, 56.99; lime, 26.35; water, 16.65.

Oleodraca occurs crystallized. Primary form an oblique rhomboid. Colour grey, white, or yellow. Fracture obscure, uneven. Hardness 4.0. Transparent. Sub-translucent. Specific gravity 2.64 to 2.07. Found at Danviksoll near Stockholm, Arendal in Norway, etc. Analysis, by Bernelius: Silica, 65.70; almina, 20.95; lime, 9.26; magnesia, 0.65; soda, 8.11; potash, 1.95; peroxide of iron, 0.50.


Olivins. [Amethyst, P. C.]

Oxalate of Iron. [Iron. Oxalate of.]

Oxalate of Iron. [Talc. Silicate of.] Found near Otter on the borders of Luxembourg. Analysis, by Damour: Silica, 43.34; alumin, 24.63; project of iron, 16.72; project of manganee, 8.18; water, 6.66.

Oxalate of Iron. [B. of Hydrogen]. Colour yellowish brown. Translucent. Has a slight bituminous odour, and softens by the heat of the hand, so that it may be kneaded. Fuses 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 Slanik in the Buchan district of Moldavia, and used for fuel. Analysis, by Carbon, 85.204; hydrogen, 19.767. It appears to be similar in composition to Hattichetine.

Paragaste. [Augeite, P. C.]

Pectinite occurs on spheroidal masses which have a radiated structure. Found at Wolfsberg in East Tyrol. Analysis, by Darley: Hardness 4.0 to 5. Lustre pearly. Nearly opaque. Specific gravity 3.69. Found in large masses on Monte Baldo, in the Southern Tyrol, and at Monzoni in the Fass-chal. Analysis, by Von Frey: Silica, 49.78; soda, 20.08; potash, 1.57; alumin and oxide of iron, 9.05; water, 3.89.

Periclase occurs crystallized on regular octahedrons. Primary form a cube. Cleavage in three directions parallel to the faces of the cube. Colour obscure green. Hardness equal to felspar. Lustre vitreous. Translucent. Specific gravity 3.78. Found in the lava of Venedos. Analysis, by Damou: Magnesia, 92.37; oxide of iron, 6.91; insoluble matter, 0.86.


Pharmacolite. [Magnesian Pharmacolite.]


Schwartzeneb in Saxony, and Frankish, North America. Analysis, by Bernet: Arsenic acid, 38.00; peroxide of iron, 40.56; phosphoric acid, 0.70; oxide of copper, 0.50; water, 19.37; insoluble matter, 0.05.

Pharmacolite occurs crystallized. Primary form a rhombohedric, Cleavage parallel to the primary faces. Colourless; also bright yellowish, inclining to red. Hardness above 6. Lustre vitreous. Transparent to opaque. Specific gravity 2.699. Found near Freiberg and near Framont. Analysis, by Hartwell: Silica, 55.14; glumea, 44.47; alumin and magnesia, 0.39.

Phlogopite, a hydrous silicate of aluma, probably similar to halloysite.

Phosphorite. [Apatite, P. C.]

Phylite. [Gigantolite?]

Pickcrivite (Magnesia Ahorn) occurs in masses composed of long parallel fibres of a silky or satin lustre. Colour white, or, viewed in the direction of the fibre, pale rose-red or light green. Compact, but easily divided parallel with the fibres. Brittle. Specific gravity 1.78 to 1.80. Found at Tarapaca in Peru. Analysis, by Stroemer: Sulphuric acid, 36.770; alumin, 11.515; magnesia, 3.890; peroxide of manganese, 2.617; dioxide of potassium, 0.025; water, 45.739.

Phricite. [Turquoise, P. C.]

Pimente. [Nickels, Ore of. P. C.]

Pigoure occurs massive. Colour siskin or oil green; streak light grey. Fracture conchoidal or uneven. Hardness 2.5 to 3. Lustre imperfectly conchoidal. Found at Wullenstein in the Erzgebirge. Analysis, by Kertel: Silica, 30.80; peroxide of iron, 0.978; water, 64.20; Ferroalumina (Oxide of Iron) occurs in crystalline masses and crystallized. Primary form an oblique rhombohedral prism. Colour bronze-yellow; streak black. Fracture conchoidal, uneven. Hardness 5-6. Lustre metallic. Specific gravity 7.288 to 3.082. Found at the Jungfer mine, Moien. Analysis, by Platten: Arsenic, 39.707; nickel, 57.044; cobalt, 0.880; copper, 0.892; sulphur, 0.817.


Pleister Slate (Poker Slater) occurs massive, with a shaly texture. Colour white, yellowish white, or yellow. Brittle. Opalite. Specific gravity 0.99. Found near Billo in Bohemia, at Zwackau in Saxony, and Auvergne, and is supposed to be a volcanic product. Analysis, by Buchola: Silica, 83.50; alumin, 4.00; lime, 8.80; oxide of iron, 1.50; water, 9.00.

Phlogopite occurs crystallized in long slender crystals. Primary form a right rhombohedral prism. Fracture uneven, opaque. Hardness 3-5. Lustre vitreous. Found at Poons in the East Indies. Analysis, by Gurnem: Silica, 45.120; alumin, 50.446; lime 10.197; soda with a trace of potash, 0.657; water, 18.886. Found at Poons (Talc. See Pheg.•)

F, (Quartz, P. C.]

Phegolite occurs imperfectly crystallized in prisms of several sides, with the edges rounded. Cleavage in one direction. Colour brown or dark brown; streak clear green. Fracture splintery and flat conchoidal. Hardness 3-5. Lustre weak. Specific gravity 2.754. Found near Brevig, Norway. Analysis, by Ermann: Silica, 49.94; alumin, 28.70; proto-
axide of iron, 6-06; protorside of manganose, 0-92; magnetite, 18-73; tianiic acid, 9-40; oxode of lead, copper, and cobalt with lime, 0-50; water, 3-78.

Praseolite occurs massive. Composed of loosely adhering fibres. Colour dark leek-green. Hardness not sufficient to scratch porcelain, but can be scratched by the fingers. Specific gravity 2-311. Found on the Killpatrick Hills. Analysis, by Dr. Thomson: Silica, 34-55; magnetite, 15-85; peroxide of iron, 14-90; alumina, 2-05; lime, 2-55; oxode of manganose, 1-20; water, 18-00. The loss amounting to 3 per cent, is attributed to an alkali.

熳 transcript. (German); purchased from the Comte de la Hydriae. (Hydriae of Magnesia) occurs in masses which are imperfectly crystallized, or present a foliated structure and crystallized. Primary form a right rhombic prism. Cleavage parallel with the primary planes imperfect. Colour brown or ochreous-brown, yellow or brown; streak yellowish grey. Hardness 4-0 to 4-5. Lustro metallic, pearly. Translucent, opaque, in thin laminae sometimes transparent. Specific gravity 3-07 to 3-10. Found on Orange County, New York, near the village of Amity. Analysis, by Clemson: Silica, 17-0; alumina, 37-0; magnesia, 24-3; lime, 10-7; protorside of iron, 0-5; water, 2-60.

Siderolite (Hydriae of Magnesia) occurs rarely in hexagonal prisms, generally in laminar masses, and fibrous. Primary form a rhombohedron. Colour white, greenish white. Steack white. Lustro pearly. Transparent, translucent. Hardness 1-0 to 1-5. Specific gravity 3-26 to 2-54. Found at Inverness, in New Jersey, New York, and in the island of Unat, Scotland. Analysis, by Bruce: Magnesia, 70; water, 30.


Smaragdite. [Amphiroolith, P. C.]

Silrislite. (Zinc, Ores of P. C.]

Saprolite (Hydriae of Magnesia) occurs crystallized and massive. Primary form a square prism. Cleavage perpendicular to the axis, very distinct. Colour pale dull brownish-yellow. Fracture uneven. Transparent, translucent. Found in the cavities of material ejected from Vesuvius. Analysis, by Monticelli and Covelli: Silica, 43-96; lime, 31-67; magnesia, 8-83; alumina, 0-90; protorside of iron, 2-00. Kobell found 4-25 per cent. of soda.

Soda Alum occurs in white fibrous masses. The outer fibres opaque by decomposition, internally transparent and exhibiting a glossy or silvery aspect. Not scratched by the nail. Specific gravity 1-83. Found at St. Juan in South America. Analysis, by Thomson: Sulphuric acid, 38-5; alumina, 12-0; soda, 7-5; water, 42-0; with a little silica, lime, iron, and manganose.

Soda Alumicite. (Monticelli, Somervullite (Humoludite) occurs crystallized. Primary form a square prism. Cleavage perpendicular to the axis, very distinct. Colour pale dull brownish-yellow. Fracture uneven. Transparent, translucent. Found in the cavities of matter ejected from Vesuvius. Analysis, by Monticelli and Covelli: Silica, 43-96; lime, 31-67; magnesia, 8-83; alumina, 0-90; protorside of iron, 2-00. Kobell found 4-25 per cent. of soda.


Sphaerolite (Kreutler, Extr.) Humboludite of Monticelli, Somervullite (Humoludite) occurs crystallized. Primary form a square prism. Cleavage perpendicular to the axis, very distinct. Colour pale dull brownish-yellow. Fracture uneven. Transparent, translucent. Found in the cavities of matter ejected from Vesuvius. Analysis, by Monticelli and Covelli: Silica, 43-96; lime, 31-67; magnesia, 8-83; alumina, 0-90; protorside of iron, 2-00. Kobell found 4-25 per cent. of soda.


Sphalerite. (Zelligite, P. C.)

Strebenite occurs crystallized and massive. Primary form a right rhombic prism. Colour pink or brownish, with occasionally a violet tints in some of the masses. Sphalerite.

Strebenite occurs crystallized and laminar, and fibrous masses. Cleavage in one direction, 3-9. Spiney to black. Streble glands to live brown. Lustre vitreous. Hardness 3-0 to 4-0. Specific gravity 3-27 to 3-4. Found at Obergund and Linnzamnelt, in Silene. Analysis, by Ramsellberg: Silica, 46-00; protorside of iron, 53-89; water, 7-100; lime, 0-577; protorside of iron, 1-888; water, 7-00; 97-41.

Stilbomelan occurs crystallized, lamellar, and fibrous masses. Cleavage in one direction, 3-9. Spiney to black. Streble glands to live brown. Lustre vitreous. Hardness 3-0 to 4-0. Specific gravity 3-27 to 3-4. Found at Obergund and Linnzamnelt, in Silene. Analysis, by Ramsellberg: Silica, 46-00; protorside of iron, 53-89; water, 7-100; lime, 0-577; protorside of iron, 1-888; water, 7-00; 97-41.
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.

**SILICA** (Haryhototriaanite). [**SILICA**, P. C.]

**STrias**. [**Wolfsberg**, P. C.]

**Tillumtbnsten** (Turtle of Bismut). [**Tellium**, Ors, of P. C.]


**Tthrine** occurs crystallized and massive. Primary form a right rhombic prism. Massive variety has a crazily lamellar or crystalline structure, with cleavages parallel to the planes of a right rhombic prism. Colour greenish grey, Streng greyish white. Hardness 6-0. Translucent in thin pieces. Specific gravity 3-60. Found at Bodenmais, in Bavaria. Analysis: Phosphoric acid, 41-47; protosilicate of iron, 48-27; protosilicates of manganese, 47-0; laths, 5-40; silica, 0-53; water, 0-36.


**Vauqulieite**. [**Chromit, Ors, of P. C.**]


**Wackerite** (Phosphatc of Magnesia). Primary form an oblique rhombic prism. Fracture uneven. Colour yellow, or different shades; often greyish. Streng white. Hardness 6-0 to 5-5. Lustre vitreous. Translucent. Specific gravity 3-11. Found in the valley of Holghare in Salzburg. Analysis, by Fuchs: Phosphoric acid, 41-73; hydrofluoric acid, 6-50; magnesia, 46-06; oxide of iron, 5-00; oxide of manganese, 0-95.

**Wakewite** (Fluoride of Titanum and Iron). Primary form an oblique rhombic prism. Fracture parallel to the longer diagonal, perfect. Colour dark 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 3-0 to 3-29. Found near Amity and Enderville, in the State of New York. Analysis, by Sheephed: Titanum, 64-71; iron, 2-144; yttrium, 0-80; fluorine, 27-33.

**Washingtonite** (Titanite). [**Titanium, Ors, of P. C.**]

**Witkittite**. [**Wilkite**, P. C.]

**Witkittite occurs in oblique rhombic prisms. Colour saligrey or brownish. Presents only feeble traces of cleavage. Fracture even or coarse granular. Hardness, scratchs glass, by nitre. Specific gravity 2-80. Found at Fabian, Sweden. Analysis, by Wechsttiser: Silica, 53-69; alumina, 21.70-; magnesia, 8-99; protosilicate of iron, 1-43; protosilicate of magnesium, 0-68; potash, 4-10; soda, 0-68; oxide of zinc, 0-3; water, with a little ammonia, 3-20.

**Wilkite**. [**Wilkite**, Ors, of P. C.]

**Wittkittite** occurs in angular grains, and in tabular crystals; form undetermined. Cleavage distinct in one direction. Colour light yellow, wine-yellow, honey-yellow, brownish yellow. Streng yellowish white. Fracture more or less conchoidal, splintery. Hardness 5-5. Lustre vitreous. Subtranslucent. Translucent. Specific gravity 3-41. Found in an island near Browin in Norway. Analysis, by Scherer: Silica, 30-62; carbonic acid, 14-47; zirconia, 15-17; lime, 26-19; soda, 7-78; oxide of iron, 2-12; protosilicate of magnesium, 1-55; magnesia, 0-40; water, 0-54.

**Wittkittite occurs in rolled masses, having a foliated crystalline structure, and sometimes presenting very small apparently isolated prisms. Colour white. Opague. Specific gravity 2-12. Lustre vitreous. Translucent. Specific gravity 3-1. Found near St. Petersburg, on the shores of the Bay of Finland. Analysis, by Dr. Hess: Silica, 40-79; alumina, 55-06; magnesia, 0-88; water, 9-88.


**Yttricite**. [**Yttrium**, P. C.]

**Yttrontialite**. [**Yttrium**, Ors, of P. C.]

**Zeagonite**. [**Phillipette**, P. C.]

**Zollite**. [**Zoltite**, P. C.]

**Zollite occurs crystallized and massive. Primary form a cubic or square prism. Cleavage indistinct. Colour asparagengreen, inclining to grey. Fracture conchoidal. Hardness about 6-0. Lustre resinous. Opague. Specific gravity 3-27. Found on Veauville.

**MANES.** Mines. Colour is properly open 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 a 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. 90, a mine of copper or tin is not to be considered a royal mine, though silver may be extracted from the ore. The owner of land in fee-simple is the owner of everything which lies in a perpendicular 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 marring of the land. In fact the general principle is that the land, which term comprehends everything in it 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 coal which have been already worked. A tenant in tail has an estate of inheritance, and incident to it the power of committing waste, as by cutting down timber or opening mines.

If a man who has a lease in fee-simple in a parcel of land, works the mines upon it, the lessee is thereby empowered to dig for the minerals; if he leases lands on which mines are already open, the lessee may work them.

The freehold 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 man 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 man works mines under his own land and follows the ore on other substance under his neighbour's land, he is a trespasser.

The act 7 & 8 Geo. IV. c. 50, § 7, enact certain punishment for malicious injuries done to mines. [Maurice's P.C.] A partnership for working a mine is subject to the same legal rules as any other partnership. [PARKER, 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 the year 1802, when he went to Pembroke College, Cambridge, on one of the exhibitions of the Hospital. 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, dammed all Mitchell's schemes, who had determined to devote himself to philosophical pursuits. A few years afterwards however he obtained as a scholar-ship at Sidney Sussex 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 become a learned and elegant writer, to 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 to resign the statutes of the college to vest in 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 Aristophanes and Athenian satirists, 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 patron 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 his works, which he had commenced time printed at the Clarendon press. During the years 1834-88 he edited, in separate volumes, five of the plays of Aristophanes, with English notes; and in 1839 he began an edition of the plays of Sophocles likewise with English notes; but as soon as 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 £500, from the royal bounty fund. In 1848 the publication of Sophocles was resumed, and the remaining four plays were likewise edited by Mitchell, though with his 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 May, 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 are those that he was a Greek scholar of considerable eminence; but his notes are often irrelevant, and the text of his author is seen to furnishing opportunities of showing his strong political opinions: he had a passionate antipathy to the popular democracy and democratic forms of government in general. (Classical Museum, vol. iii. p. 213, &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 Eton, and was kept at Chevening Park by the well-known Mr. Gilpin, who afterwards owed him the living of Boldre. Ill health caused his removal from school about the age of fifteen; and it seems to have been with very insufficient preparation that he became a scholar in Pembroke College, Oxford. His time at the university was idly spent, and he left it without taking a degree. Perhaps the most important influence exercised on his mind by his academic residence was derived from the Vinegar Stone, 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 abandoned the legal profession and became Lord Redesdale. 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 predilections 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 followed in 1776 by his first and most important book, published 'A Treatise on the Military Force, and particularly the Militia, of this Kingdom.' In 1776 he lost his wife, and was himself seized with a dangerous illness, on his recovery he was given the charge of New Forest. Before leaving home he had become acquainted with the French scholars Voltaire and De Meunier: the former introduced him to the Baron de Saint Croix; and his intercourse with these young and brilliant 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 Western Forests, and in 1784 commissioned 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 Beeston, a nomination borough of his maternal kinsman the Duke of Northumberland; and from 1812 till 1818 he was member for New Bemom. His parliamentary career was confined to two or three speeches on the militia laws. In 1802 he succeeded, through his mother, to the Revels estates in Yorkshire. But his paternal estate on the borders of the Welsh Marches was his particular residence. He died there on the 8th of February, 1827.

His 'History of Greece' was written and published in successive portions, the dates of the first edition, in quartos, being 1774, for the first three volumes; 1790; and 1851, for the following ones. His 'History of Britain' was also published in several portions; the first, for the years 1700; 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 1892 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 the work. These opinions have been exposed Mr. Mitford's 'History' to much animadversion. It is determinedly anti- democratic; and this turn of thinking affects seriously the fairness of the estimate which it forms both of characters and of events. His partiality is especially palpable in his account of the war between the Greeks and Pharaoh of Macedon. Philip is with him a perfect king, hero, and statesman. Demosthenes is a dishonest and malignant demagogue, and the Athenians are a horde of treacherous mercenaries. Yet the author's researches are the result of long and careful reading, and as such are looked upon as other parts of Grecian antiquity. He has elucidated with remarkable success the state of political parties in some of the severest struggles of Greek politics; and he has suggested new and very accurate views of several other points. He has been led to these results mainly by his severely critical way of estimating the ancient authorities, and by his systematic endeavour to gain his knowledge from cor
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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 consistency of the clay, nothing more can be given here than a sketch 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 modelling a bust, and agreed only to do what they cannot perform. Wire tools are the most useful, being fashioned into loops of various shapes and sizes, round and angular, and fixed into wooden handles. They accomplish any required form without driving the clay, and are especially useful for shaping the superfluous 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 removed by the slight rubbing of the modelling tool in making the creases. These wire tools are the most useful when applied to concave surfaces, especially those in the close or narrow folds of drapery, the wire being sometimes notched or indented, to give a rough surface to the clay, and it can be used to form box and eddy, of various shapes and sizes, curved, straight, pointed, rounded, and flat and broad; the broad tools being notched, and designed chiefly for working the large convex masses, or large folds in drapery. The bar tool, or the tool of 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 potter's clay, but should be of the best quality. It must be so wet that it will not stand in a mass much larger than its own width without support. The clay adheres much more to the tools when wet, but it is at the same time harder, and quite worked, a matter of great consequence, as the patination of the artist less tried, and some expenditure of time is saved. The supports for the clay are a most important consideration, for if not well chosen, or if the clay is not firmly adhering to them, a weight of 6 months of labour, might suddenly fall to pieces by its own weight. This accident happened to Don Jose 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 not courage, or waited 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 preferable 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, a stand or a chair, about thirty inches high, and thirty inches square,—for a bust it must of course be much higher; above this a solid circular plinth is fixed on a wooden box, and is supported by a strong arm. It may be better to use short slightly conical rollers, fixed to the plinth near the circumference; the plinth moves easily on such rollers than wheels, and the rollers afford a more solid support and last than when diminished or removed. The sculptor must be able 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 ground, as it is the main support of the whole skeleton of supports. In loosely draped figures which are to be removed, it is advisable to fix a vertical beam of wood to the main iron bar; for though the bar will keep the clay perpendicular in its place, it is no provision against the sinking of a great mass, and the quantity of clay; for some figures, even of a miniature size, only, amounts to about two tons. Two or three pieces of wood must be fixed to the main bar at the shoulders and the loins, from which the supports of the arms and legs must be started; and a third piece, fixed in the same manner, is to be provided to support 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 cooper wire, 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 similar 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 finished. The building of such a skeleton for a figure of the heroic size is often so great a work that it would be advisable to always provide a young sculptor, in modelling his first figure, to procure some experienced hand to construct such a skeleton, as it is more easily elevated and detached from the figure, the supports of the arms, and it would be almost impracticable to allow the arm to be removed at pleasure, which would enable the sculptor to model the part beneath it with much greater ease, and diminish 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 metal arm, which could be fixed in the plinth by a bar of wood or metal; or merely thick or twisted wire, when of a smaller 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, 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 squirt, even in the presence of their sitter, when modelling a bust; Nolleken's, according to his biographer on account of the great efficacy of his hands, never ceased to use it. Bojon, a sculptor who modelled 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, the air 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 drapery 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 off, and before it is allowed to dry, it may be again, and 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 set well, the mould may be taken off, the lining of the cast removed in fragments, and the cast is exposed, and complete, the finished work. If casts of it are required, a new working mould, or safes mould, as it is termed, must be taken, in two or three masses; and in the same manner the cast is copied by the carvers, with the assistance of the pointing-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 turned to any side, and in a mass of figures, even in small ones, it is practicable, because any error in VOL. II.—2 8
a small model 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 termo-cotta (baked bath) 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 Pompeii; 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 baking 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, and recourse to it is found of rare art, as 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 excellent, and recouered to in works of full art, as constantly in the potteries, and by frame-makers.

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title of Le Grand; other basso-relievo for the barriques of Paris, and the Château de l'Île Adam, and the colossal figures of Bretagne and Normandie at the barrier des Bons Hommes; an equestrian statue of Napoléon; and the basso-relievo of the warrior devoting himself to his country, or France sur-
rounding the tribune, in keeping with his defence, now in the gallery of the Luxembourg: it was ordered in 1798 for the vestibule of the Luxembourg facing the garden.

(Gabet; Dictionnaire des Artistes de l'Ecole Française, &c.)

MOLYNIA, a genus of grasses belonging to the tribe Festucineae. It has unequal glumes without lateral ribs, shorter than the lanceolate spikelet of 3 or 3 sessiletridical-
flowers and a series of small palisading on the loose fruit, and the styles terminal. There is one species which is British—

M. cornua, which has an erect elongate narrow panicellate, spikelets from 1- to 3-flowered; the outer palea rarely 5-


denned, 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. desparaspera of Lindley.

(Byington; Manual of British Botany.)

MOLYN, PIETER, [Tempora, P. C.]

MOLYNEUX (golnito-), C. S.

MONCREIFF, SIR HENRY, General and ecclesiastical leader in the church of Scotland, was born at Blackford, in Perthshire, on the 6th of February, 1750. His father Sir William Moncreiff, though a cedett of the family, succeeded to the title of his uncle, Sir Henry, and Sir John, and was made minister of Blackford, in 1744. Sir Henry was the sixth of his family that had belonged to the clerical profession. He studied at Glasgow and Edinburgh, and was ordained a minister on the 29th of August, 1771. Though he seems probably the only one 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 advantages of rank and position had given a bias to the Deistical. His character and conduct in their particular case were matters of very much speculation.

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, 1807. He was frequently moderator of the General Assembly, and his name was con-
spicuous in nearly all the ecclesiastical discussions connected with the church of Scotland during his ministry 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 Observations' as much as respect for this Life and Writings of Dr. John Erskine.' [Erskine, JOHN, P. C. S.]

His Sermons, of which there had been some separate publica-
tions during his life, were collectively published after his death by his family and friends, who affixed a short mo-
mentary dedication of the author, by his son Lord Moncreiff.

MONEESES (from p5e5, sole, or alone), a genus of plants belonging to the natural order Ericaceae and the tribe Pyrole-

lens. It has a 4-toothed calyx; 6-lobed corolla; 10 inclined stamens; the anthers dehiscing at the base by two holes, the cells elongated and tubular; the stigma 4-toothed; the capsule 6-celled; the valves dehiscing from the apex, destitute of tomentum. There is but one species in this genus, M. grandif-

flora. It has a creeping root; large solitary terminal droop-
ing open white flowers, nearly an inch broad; very large stigmas. It is a native of Europe, Asia, and North America. It is a very useful plant, and 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 commodity is exchanged. It is the most direct and obvious form of exchange 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, when commodities 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 neces-
sary. Objects of every variety are sought and sold, the pro-
duction 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 ex-
changeable value of all things is determined, in a large, not in-
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, but for their respective values to al-
ways be the same; but if a standard is established by which each can be measured, their relative value can always be as-
certained 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 value of each may be measured by one standard common to all. Until such a standard has been agreed upon, the diffi-
culties of any extensive commerce are incalculable. One man may have nothing but corn to offer for other commodities, the owners of which may not have ascertained the 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 one another, or would be guided by their own experience and accidental situations. In Europe the different kinds of commodity their experience would fail them, and they must guess more. But with money all becomes easier; each man adheres a price to his own commodities, and if barter should continue to be the form in which exchanges are ef-
fected, every bargain could be made with the utmost sim-

plicity: for commodities of every description would have a denomination of value affixed to them, common to all and un-
derstood by every individual in the community.

But however great may be the importance of money as a measure of value in facilitating the exchange of commodities, it is infinitely more important in another character. In order to exchange his goods it is not sufficient that a man should be able to measure their value, but he must also be able to find others who, having a different description of goods to offer as an equivalent, are willing to accept his goods in exchange, in such quantities as he wishes to dispose of. Not to enlarge upon the obvious difficulties of barter—suppose one man to have nothing but corn to sell, and another nothing but bricks: how can any exchange be effected unless each should happen to require the other's goods? But presuming that this is ac-
tually the case, it is probable that each will require as much of the other as will be an exact equivalent; or in other words, the commodities exchanged may not be proportioned to each other in any length of time, would therefore be extremely incon-
veni ent. In order to dispose of his corn, the producer might buy the bricks and dispose of them to others; but in that case, in addition to the business of growing corn he must beco-
me a seller of bricks. But human labour has a natural ten-
dency to a division of employments; and as society advances in wealth and in the arts of life, men confine themselves more and more to distinct occupations instead of practising many at the same time. [Division of Employment, P. C. S.]

With this tendency a system of simple barter is obviously in-
consistent; as by the one, a man is led to apply the whole of his labour to the production of one article, and in conse-
quence he has none to sell, but in the same way the other, for many. By the one he has only to produce and sell; by the other he must also buy what he does not want himself, and become a trader.

But all these difficulties are removed if some one commodity can be discovered which represents a certain amount of labour, and which all persons agree to accept as an equivalent for the products of their own industry. If such a com-
modity be found, it necessarily becomes the universal medium, whatever other commodities may be in circulation, and where their value has not been ascertained with precision.
barter gives place to commerce. But what must be the qualities of any thing which shall be productive of the products of their own labour? It is 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 thing bargained for", and the condition of the bargainer. 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 parts with money; the former enjoys the value of the bargain, and the latter has the use of the money. 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 intrinsic value equal to its value under all circumstances. As a measure of value it is essential that it should always be the same, so 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 defensible 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 uniformity of money, complete uniformity of value is an impossibility. There is no absolute value. All likenesses of value do not 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 measure save in the mind. 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 of any kind; 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 any commodity, 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 representative value could not be disturbed. And in this case, a given denomination of money will represent a certain number of bushels of wheat; at another time, the same money, unchanged in real value or in demand, will represent a much greater quantity of wheat. Every merchant, a by-product of the skill and experience of mankind, facilitates production, and by saving labour reduces the real value of commodities. Their value is also liable to temporary depreciation from many causes, and to absolute or insufficiency. 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: Ist, a producer has to give a larger quantity of his goods than before for the same amount of money. Secondly, 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 of commodities had not been disturbed. It follows from these circumstances, that, as a general rule, all creditors whose debts have been calculated in money derive advantage from any increase in its relative value to commodities; while debtors derive 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 intelligible the following example may not be superfluous. A man finds a gold coin which he deposits in his bank for one year at a money rent; and that from any cause the value of agricultural produce is no longer represented by money during that year, he shall receive, at the end of the year, into his bank account the interest of the money he had lent to the public, but he loses the use of the money, which he had been continually increasing. In order to pay his rent, he must now sell a larger proportion of his produce, even though its total value is greater than before. 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 men are insufficient 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, metals 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, such as beads, shells, silks, Sophisticated objects, highly civilized countries, and cowrie shells in the less civilized parts of Africa; but in all some 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 whenever commerce is carried on 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 commodities.

More than two thousand years ago, indeed, Aristotle saw the principal use of metallic money was that its value was less fluctuating than that of most other substances (Ethic. Nicom. v. 6). But however clearly this great philosopher may have observed the comparative inferiority of metallic money, he was not engaged in common barter, who considered their own convenience and security without reference to any general objects of public utility. They used gold and silver 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 as prudent merchants, they have used metals as a standard of value, and as an article of exchange, which facilitated barter. Their comparative scarcity, the difficulty and labour of procuring them, their extraordinary beauty, their singular purity, their adaptability 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 certain to find a market; none refuse to accept articles in payment which they could immediately transfer to others; and thus gold and silver naturally became articles of commerce, readily exchangeable for all other articles, before they were circulated 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 recognised currency, was attended with the discovery of new principles. Money, articles at the moment when its value was estimated, was very natural. Merchants carrying their wares to a distant market would soon find it necessary to calculate the quantity of gold and silver which they could obtain, reduce to money, and spend for supplies, or to buy other commodities. They would not know what articles it would be prudent to buy until they reached the market and examined their quality and prices; but a little experience would enable them to predict the quantity of gold and silver which would be an equivalent for their own merchandise. Merchants from different parts of the world, meeting one another in the same markets, and finding the convenience of assessing the value of their goods in gold and silver, would begin to offer them for certain quantities of those metals, instead of engaging, more directly, in bartering one description of goods for another; and thus, by the ordinary course of trade, without any law or binding custom, the precious metals would become the measure of value and the medium of exchange.

But when gold and silver had attained this position in commerce, they were not the less objects of barter; nor were...
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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 were readily fused and moulded and valued according to 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 the exchange of such, which is at all times sustained by a little ivory balance on the principle of the steel-yard.’ (Davis’s China, c. 22.)

Notwithstanding the ease with which gold and silver are divided into small quantities, each of which is of the same intrinsic purity and value as the others, the trouble of weighing each piece, and the difficulty of assaying it, render these metals in bars, or other unassayed forms, extremely imperfect instruments of exchange, especially when they are used in small quantities. However accurately they may be weighed, it requires considerable skill and labour to assay them, which in small pieces would scarcely be repaid. Even in large quantities the difficulty of assaying their fineness, in countries which have made considerable advances in the arts, is greater than might be expected. The Chinese affect much accuracy in the art of assaying. The stamped ingots of silver in the possession of the Chinese are, for other commodities than natties, or sixty-eight parts in a hundred of pure silver, and two per cent. only of alloy; and strict regulations for maintaining this standard are rigidly enforced. Hence we should naturally infer that nothing but small fluctuations in the value of silver would be particularly directed to the most accurate assays. Yet at Canton an enormous trade in opium has for a long series of years been conducted entirely in silver, which has been found to contain no large mixture of copper, but that it bears a premium of five or six per cent. for exportation to England. (Davis’s China, § 22.)

If the Chinese have been unable to discover the presence of gold, which would be their interest to appropriately, how difficult must it be to detect alloys of base metals in gold or silver circulated amongst a people in the ordinary course of trade. To avoid this difficulty coinage was introduced, by which portions of gold, silver, copper, and other metals have been impressed with distinctive marks, denoting their character, and have become current under certain denominations, according to their respective weight, fineness, and value. These coins have always been issued by the government of each country as a guarantee of their genuineness; and the counterfeiting of them has been punished as a serious offence against the state.

In rich countries these three metals of gold, silver, and copper are very convenient substances for the manufacture of coins, on account of the differences in their relative value. Gold is the subject to continual variations and changes in its value, convenient for large payments, silver coins for smaller payments, and copper coins for those of the lowest value; while all the larger coins are multiples of the smaller. These several descriptions of coin are found to circulate suitably well: they are universally received as money within the country in which they circulate, and the principal part of all payments of moderate amount is made in them. But payments of large amounts cannot conveniently be made in coins of any metal; and in this and other countries paper money and various forms of credit have been used as substitutes. Of these we shall speak presently; but it will first be necessary to consider the suitableness of gold and silver coins as standards of value.

Coins made of these metals are not exempt from the laws which govern the prices of other commodities. They have accordingly undergone all the changes and fluctuations, and are at no time secure from variation. In the sixteenth century new mines of extraordinary richness were opened in America which were worked with such ease, and were so unusual a quantity of gold and silver, that the metals, though representatives of so much labour expended in their production, was lowered all over Europe to a third of their previous value. And thus a revolution, so to speak, was effected; from their present great extent they lost their standard fineness, in coins of a given denomination; 2; by raising their nominal value and ordaining that they shall pass current at a higher rate; and, 3, by debasing the metal. The first is an effect, the second a cause, but reducing the quantity of pure metal and increasing the quantity of alloy. In all these ways the coins of England were debased at different periods of our history; and to this present day the debasement of coins from the Conquest to the reign of Queen Elizabeth the total debasement of the silver coins have been estimated at 85 per cent. (Lord Liverpool, On Coins, p. 55.) By acting upon the principles of demerit of character thus produced, coins can be artificially raised; and the result of measures connected with the coinage of this country was, that in a period of 115
years, from the 1st James I. to the 1st George I., the value of gold coins, as compared with silver coins, was raised 89 per cent. (Ibid, p. 84.) No further examples are needed to prove the inconstancy of coins as a standard, when they form the sole currency of a country. Although there are the 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. (1236) for gold pieces at the value of less than 10s. 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 accustomed 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 III., 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, and were both legal tenders. To what an extent their 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 year 1774, when it was declared by statute (14 Geo. III. c. 33) that silver coins should be paid in payment of any sum exceeding 23d., except according to their value by weight, at the rate of 5s. 2d. an ounce. This was a temporary law, but was continued by several statutes until the year 1810, when the legal tender of silver coins was further restricted to payments not exceeding forty shillings (20 Geo. III. c. 65). 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 a question of much doubt 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 change is to be fabricated, should have reference to the wealth and commerce of the country for which it is intended; that copper or silver coins of the lowest denominations suffice for the commerce of the petty country; that advances in wealth its commercial transactions are more costly and require coins of corresponding value. As a matter of convenience this is undoubtedly true. Gold is the standard in countries where the standard of value is not in universal use; for in these countries the facilitating of effects large payments in the current coins of the two countries can admit of little doubt. Habit will familiarize 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 it would 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 where gold is the standard. In either case, however, that metal which is chosen by the state, in order to govern all acts of commodities, shall be the metal which more nearly conforms to its standard, and is subsidiary to it. But even if the relative convenience of gold or silver as a standard were the sole question, it could not affect in the slightest degree the question of the value of either metal 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 the country are paid and expended in that form; and in this medium of large numbers of small 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 very 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 the large mercantile bargains which relate to the internal trade of the country, and in frequency and number, thousands of times as great. 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 fitness 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 in the money of a country? Is the main question to be determined by the medium of that coinage which is most easily adjusted to the wants of the people? If we think at all on the medium by which to make bargains? In what medium shall the whole property of the country be valued, from one year to another? By what standard shall the relative value of all things be compared? 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 plate and other manufactures, it is less an article of common use than silver, and is consequently more especially to the purposes of money. On the other hand, it is contended that gold is used in large quantities for jewellery, watches, and decorative purposes, and that being a comparatively unaccustomed and unaccustomed value 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 1 to 50; and their relative value is as 1 to 15. (See Bullion Report, 1810, 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 of the chief item of plate. 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 for other purposes, such as coins for the exportation of goods, or coins for the exportation of the commerce of a country; or there be a foreign war, its metals are in demand for the payment of the troops and for the purchase of foreign goods; and the com-
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 gold is wanted, its coinage supplies it. The exportation of which gold is annually limited; but it has been limited both in the past and in the present by the Bank of England. 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 values. But such comparisons are extremely delusive, 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 a Variation? Or if gold is silver, and one purchases on the same principle, there is a standard wanting, for the notes are made to conform to the value of gold, and not to the value of the silver. These elements of uncertainty make the attempt impossible. But, if we place ourselves upon them, the fluctuations in the price of silver bullion would appear to be very slightly greater than those of gold. (See Bank Charter Report, 1829; Bankers' Notes Report, 1841, No. 39, App. p. 39; Bankers' Notes Report, 1851, No. 39, App. p. 416.)

Results do 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 disturbs 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 bullion; and though its influence on prices is very perceptible, the cause is 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 principle 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 purposes of money; but of the two, gold is the more important, 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 them 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 unwise extravagance. It is as if children should play at cards with gold counters instead of paper money. Such large impositions 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 purposes of money; but of the two, gold is the more important, upon the whole, the most suitable for a standard of value.

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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 does not particularly care in what form he obtains it, and be willingly accepts a note, if it be offered him instead of gold. He pro-
obly owes money to another, to whom he, in his 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-
vency 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 bank-note over the country; because 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 issued long enough to be sure that they will receive and 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. It is consequently by a distinct medium between local gold and silver, and other descriptions of money is gradually lost sight of; they are readily convertible: they are universally circulate[d]; habit familiarizes the use of them; and at length, without the sanction of any law, they become money: there, and not the state, has coined them. Still any one may refuse to receive them, and the extent of their circulation depends on the credit of the issuer. Let a whisper be heard against his policy, and in a single day all his notes may be turned 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 con-
venience 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 in addition to them; not being the same as those of the coins; and if it be a properly regu-
lated currency, its value will also be precisely the same as that of the coins of a like denomination. A hundred pound note should purchase precisely the same quantity of goods as a hundred sovereigns. But how is this equality of value to be main-
tained 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 real 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 between 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 value is merely nominal; and its value, supposing its credit to be good, must therefore depend entirely upon the proportion which the quantity issued 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 be depreciated. So strong is the operation of this principle, that promissory notes, which are a legal or national pressure, can be raised upon a premium of 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 inconvertible, but limited in amount, its value will be sustained. And further, if government paper and local notes be concurrently in circulation, and if the latter be in excess, the value of both will 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 fluctuating, is one of those difficult problems which have perplexed theorists and statesmen, and still remains to be completely elucidated by experience; but the principles upon which any sound system of paper-money must be founded are now agreed upon by the best authorities.

Let it be supposed that no paper-money is in circulation but government paper, paper-money must be converted 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 pos-
sessed of a real value, and being in demand 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 paper-money is not an element of stability in itself, and unless its issue be adjusted with the utmost nicety, its value will constantly fluctuate. The object to be secured is an equality of value between all descriptions of paper-money, which is a necessary condition of 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 be done either, by letting it pass directly into gold or silver, whenever its holders demand such a con-
version. To regulate the issues of inconverible paper is like filling a vessel with water in the dark, and without a measure: it is by the overplus that they are known to be full; while a convertible paper, under proper regulation, adjusts itself to the standard of the precious metals.

If convertibility be desirable when there is no other paper in circulation, paper-money issues may be avoided, and less

uncompensable 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 convertible, other issues of paper will in some degree conform to its standard, as it, in its turn, conforms 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 foreign imports. A diminished proportion of notes in the state, and a larger proportion in foreign countries, will raise the price of gold and silver, and whenever this occurs, the exchanges are said to be unfavourable. If a state bank issuing notes be re-
quired to give gold or silver in exchange for them, it must be willing to do so, and will do so as a constant proceeding. 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 curtailing 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 bullion effects a proportionate contraction of the cur-
rency and restores the exchanges to a healthy state, by ad-
justing the quantity of money to the requirements of ex-
commerce. This is a simple mode of regulating the circulation of a country, and if all the paper-money were issued by one body only, it could not fail to be successful. So far as the principle has been tested in England it has been successful; but its operation has been interfered with by the competing issues of many independent banks, and by the admixture of notes not regulated by law. Both these causes of disturbance have been partially provided against by the recent Bank Charter Act (7 & 8 Vict. s. 32), and the experience of a few years will show if there be any imperfection in it. The subject of the paper-money 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 sufficiently treated of. In the first place, we cannot quit the subject of convertibility without advertinge to a point of great importance. In order to regulate the issues of paper with reference to the exchanges, it is by no means necessary that there be a promissory note or claim, but a bill of exchange in the hands of the issuing body in exchange for its own notes. Uncoined bullion will serve the purpose equally well, and would occasion a considerable economy in the coinage. It would be much too expensive, and would lead to over-issue, 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 certain sum for the purpose of purchasing coin, unless 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 quality 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 gold and paper restored. This excellent system was proposed by Thomas Working, and was entitled ‘Proposals for an Economical and Safe Currency,’ and was carried into effect, for a short period, on the resumption of cash payments, in 1819, but was succeeded by the present plan of convertibility of gold coin, which is more costly and less secure in its operations.

In regard to the issue of paper-money there are two antagonistic theories which must 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 convertibility 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 government 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; 2ndly, the solvency of the issuers; and 3rdly, the value of paper-money as a medium of exchange and as a substitute for specie. The 1st question was solely considered, it would be difficult to oppose the claims of those who insist upon the right of free issue.

The profits arising from issues of paper-money 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 royal 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 bears to a coinage; and if the law had been accompanied by the usual sinking clause, a benevolent legislature would have 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 responsible for the solvency of its representatives, than for the solvency of those who act upon its behalf. But there is an essential difference between a promissory note and a bill of exchange. The one is money and discharges a debt; the other leaves a debt outstanding 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 must pass through the agency of the acceptor, but also upon the credit and responsibility of each indorser. A bill is circulated amongst merchants precisely as credit is given to persons of known solvency; but a promissory note may be the bearer of the credit of the person issuing it, 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 its limitation. The interest of individuals 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.

The solvency of the issuers of paper-money is a point which those parties only who may happen to hold the notes of a particular bank: it does not affect the whole country. If a bank fails, 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 effectual may be the securities 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 insolvency and the securities of the bank against the public are two different things. The former may be complete; the latter may, at the same time, be inoperative. The mode of sustaining the value of paper-money out of paper is precisely identical with that of specie. The paper-money is only an imitated silver coin, and it is said to be imitated. It is only by means of convertibility and by a reference 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 principles or with reference to the exchanges, but to promote the business of banking. If too many should be in circulation, the action of the foreign exchanges cannot be brought to bear upon many independent banks with sufficient force and distinctness, and the convertibility 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 gradual 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 would be greater than the benefit to be derived from the exchanges, and for this reason, it is necessary to avert it. It renders all commercial transactions, it injures public credit, disturbs prices, and suddenly withdraws the standard of value by which all existing obligations and all transactions are judged. With a freedom of issue in one 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 insolvency, there is no principle at work 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 sacrificed every commercial transaction to an ill-regulated currency; while others deny its influence upon prices and upon the general arrangements of commerce. The opinions of both these parties are probably extreme, for with reference to the exchanges, and the general business of the country, no principle more certainly depends upon a healthy and well-regulated condition of the medium in which they exist. A well-managed currency cannot prevent the occurrence of periods of excitement and over-trade; but it will mitigate the effects of a great commercial pressure and distress; but it may tend very powerfully to diminish the frequency of their return, to restrain the suddenness of their outbreak, and to limit the extent of their mischief.

Remarks on the Management of the Circulation, 1840.
As yet such promissory notes only have been spoken of as are 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 money, and are said to form a part 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 a sum at a future period. They are in practice 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, but as the offer of a debt to be paid 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 a bill of exchange must be adjusted to the current money 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 money be relatively cheap, he makes a better bargain; but the exchange itself is the same, and all goods which had been originally purchased with it. Every bill of exchange when first drawn and accepted, and subsequently endorsed, represents, at each transfer, a distinct commodity, which bill is in circulation. 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 these commodities which are exchanged for means of bills may be set off against the value of other commodities represented by the bills, while the notes and specie taken together have a value in the aggregate of other commodities which will be added to the balance of the bank in an inquiring after 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 the banking deposits, as they currency 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 foreign exchanges. But it is not a fact that the bill or deposit cannot be considered that the whole of the deposits are currency, for a large portion of them is invested by the bankers; and if every depositor were to call for his deposit 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 bankers in notes and specie, in the same category with bills of exchange and deposits, and transfer them to the list of the 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 settlement is made in the medium of exchange, and neither bank nor personal account is regarded as the money, but the estimated value of the transaction itself cannot be reckoned as a part of the circulation, for it were, then, commodities themselves would be money.

In the latter part we would select 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 100l., and that he wishes to purchase cotton of the same value, we assume that he will go directly to the merchant, B, to whom he sells 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 in-

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MONKSHOOD. (Ac'antum, F. C. S.)
MONROEY, JEAN BAPTISTE, a very celebrated fruit and flower painter, was born at Lille, in 1635. He was educated as a historical painter at Antwerp, but he afterwards became the pupil of Peter Paul Rubens, with whom he remained ten years, when 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 the Duke of Montague, and was allowed to remain in Paris with many of his flowers and other similar pieces. It was owing to the beauty of these works that he was invited, about 1690, to London by the Duke of Montague, then English ambassador at Paris, to decorate Montague House (the late British Museum) in a similar manner; and the few and beautiful flower decorations of this palace, which is now pulled down, must still be fresh in the recollections of many. He painted 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, who took such delight in seeing him paint that she spent nearly all the time that he was at work in watching him. There are fourteen flower-pieces by Monroyer, or Baptiste as he is now commonly called in England, in the apartment named George II.'s private chamber, at Hampton Court; they are however dirty and badly hung. Monroyer was commonly styled 'the flower-painter' in England in his own lifetime. He paid a fine of £500 to the Duke of St. Albans, 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 call himself Jean Baptiste Monroyer. Monroyer's style, though not by far so minute or highly finished as that of Van Huysum, is infinitely more free and more brilliant, equal and true and effective. His selection of flowers, animals, birds, and shells, and the shade and touch, are all equally excellent and faultless: his works in their perfect condition must have rivalled nature herself. The brilliancy of his colouring is extraordinary. He was particularly fond of stamens, petals, and small objects, and a few white flowers together in a marble vase, and there are several etchings of such groups by his own hand: the vases are placed on pedestals or tables. His best works are in this country. The prints after his works amount to about 80, and make a good folio volume: his own etchings are marked J. Baptiste, sculp., whence probably his now common name of Baptiste. His son Antoine Monroyer, likewise a good flower-painter, was called the younger Baptiste in England. There is a portrait of Monroyer engraved by White from a picture by Sir Godfrey Kneller.

Essay towards an English School, 1706; D'Argenville; Walpole; Huber.

MONOTROPA (from μόνος, one, and ῥόδος, a turn), a genus of plants belonging to the natural order Ericaceae and the tribe Monotropae. It has a 4-6 parted calyx, a corolla of 10 petals, no stamens, and an ovary which is the only part of the flower left visible after the petals are fallen. The 10 stamens with kidney-shaped 1-celled 2-valved anthers; a pistil; a capsule; the 5-celled, 5-valved, many-seeded. The species of this genus are singular-looking plants, found growing at the roots of trees, and destitute of the green and bright colours which characterise the other forms of vegetation.

St. Hypopitys, Yellow Bird's-Nest, has the flowers in a drooping cluster, lateral ones with 8 stamens, the terminal ones with 10 stamens, the fruit erect, the bracts and flowers glabrous externally. The stem of this plant attains a height of 8 or 10 inches, is succulent, simple, clothed with ovate scales, terminating in a short cluster, dingy yellow, at length turning nearly black. The flowers with large scaly bracts. It is a native of Great Britain. This, with the other species of Monotropae, being constantly found at the roots of trees, was supposed 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 the 'Phytophylac', page 25, has given the result of a very accurate investigation of the subject, and has proved that the fibres of the roots of Monotropae possess spongioles and take up their nutriment in the same way as other plants. Most specimens of Monotropae are found growing up, presenting a fleshy substance, which adheres to their fibres and the roots of the plant near which they grow, so closely, that they were supposed to be poritious of the roots of the Monotropae. On examining this fibrous substance with care, Mr. Rylands found that in all cases it consisted of a species of bozydyl fungus which had been developed upon the roots of the Monotropae, having no organic connection with these plants. The species of fungus varied in different specimens, and were found to belong to hitherto undescribed forms of Cryptogamia. There can be little doubt that the other species of Monotropae are of the same nature as Hypopitys, and that the microscopic spongioles in which the fibres of their roots are imbibed have referred the species here described, and two others, to a genus called Hypopitys. This includes the European species, whilst the old genus, Monotropa, embraces two American species, for Monotropa uniflora and M. uniflorus. The last species have not the musky semi-fragrant odour of those belonging to the genus Hypopitys.

(Don, Gardener's Dictionary; Phytogeog., vol. 1.; Babington, British Flora.)

MONTAGUE, GEORGE, was descended from an ancient family residing at Lakenham, 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,' 2 vol. 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 'Tessae Britannicae; or Natural History of British Tissues,' with plates of five pieces, 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 Barbastellae 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 1814. (Biographical Dictionary of Living Authors; Watt's Bibliotheca Britannica.)

MONTALEMBERT, MARC-RENE, MARQUIS DE, a distinguished military engineer of the eighteenth century, was born July 16, 1714, at Angoulême. He was descended from an ancient and noble family; and, having received an education in which both literature and sciences were judiciously combined, he entered the army at eighteen years of age.

In the course of his first campaign (in 1733), he was present at the siege of Kehl, and in the following year he distinguished himself at the siege of Philipburg. He served afterwards with considerable reputation in Bohemia, when a French army under Marshal Broglie and Belleisle was in that country; and, on the retirement of the army from thence, he returned to Paris, where he devoted himself to the study of subjects which have relation to the military art. He was admitted a member of the Académie des Sciences in 1747; and he wrote several papers 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 in 1757, Montaubert was attacked, as an agent for the French government, to the relief of the Swedish and Russian armies; and he appears to have been consulted by the allied generals respecting the arrangement of the plans for the different campaigns. In 1777 he
published a small work entitled 'Correspondence pendant la Guerre de 1757', which contains much interesting matter relating to that war. In 1779 he was appointed to construct a fort, and the application of several of his principles in 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 with equal force, so that 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 1776, a small work in 1to, entitled 'Memoires de M. d'Enclos sur les Batiments militaires'; and in 1776, one under the title of 'Cheminée-Poêle.' He also published, in 1801, a pamphlet entitled 'Relation du Siège de Saint-Jean d'Arc.' But the work by which his name will always be connected with his profession, his memoirs, red in the fortification Perpendiculaire, ou l'Art Defensif surprie à l'Offensive, which was published at Paris in eleven quarto volumes (1776 to 1789).

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 place of meeting, to have a casemated work like a small ravelling. The advantage to be gained by this project is, chiefly, a diminution of the expense of construction; and, after some other modifications of the existing fortifications, Montalembert dwells at length on that system which gives its name to the treatise. [Fortification, F. C.] The perpendicular fortification consists of four lines of rampart, the breakwater, the main range and the skirt, the side-skirt and re-entering parts, and three of these are defended by a powerful fire of artillery, which, being placed in casemates, is liable to be damaged by the enemy; while spacious terre-pleins, at the foot of each rampart, afford the troops of the garrison to engage the besiegers with forces superior to any which can be brought against them.

In the 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 casemated 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 defend Cherbourg were executed on that 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 coasts. In the fifth volume is contained some observations on the fortifications of Cherbourg and on the isle of Aix. The ninth volume, which is particularly entitled 'L'Art Défensif supérieur à l'Offensive,' contains sundry projects for circular redoubts and for a casemated fortification, consisting of a casemated 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 defend Cherbourg were executed on that principle.

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 those 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 destroying an enemy and putting an end to his science of war.

Montalembert married a lady who was distinguished as a performer on the French harp, and who wrote a novel entitled 'Elise Dusenmilli,' which was printed in London in 1798. It is said that Montalembert composed for the theatre some small pieces which had a certain success. An inscription to his memory is proved from 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 experiments 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 foundations at Perigord, and his interest; a copious publication of works containing 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 1780 he came to London; but, after remaining some time, he, on account of the health of 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 spirit of the time as to be a member of the Committee of Public Safety. After being, however, employed to an artist on a work with which he had long been occupied—the construction of a considerable number of models relating to fortifications and artillery, and the valuable collection, when completed, he presented, in the Committee of Public Safety. At the same time, with other eminent engineers, he was constantly consulted by Carnot on subjects relating to the military affairs of the republic. He died of a dropy, March 29, 1809, being then eighty-six years of age.

(Éloges de Montalembert, by Delia de Sales; Biographie Universelle.)

MONTEN, DIETRICH, an eminent German battle painter, was born at Düsseldorf in 1799. He showed from his earliest youth a great love for accounts of wars and battles; and Honor, Tasso, and Ariosto were his favourite authors, and he used to read them while engaged in his profession. It is said that in order that he might have some practical knowledge in military matters he enlisted into the Prussian army as a volunteer in 1816, and served accordingly for twelve months. At the expiration of 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 to benefit himself by the study of the works of Peter Iesos, who almost 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 Caposucchi of the painters of Munich, and the notice of the present king of Bavaria, Ludwig I. He was intrusted by Cornelius, in 1827, with the execution of three of the frescoes of the arcade of the Hofgarten—the storming of a Turkish entrenched by the Bavarians at Belgrade in 1717, under the elector Carl Albrecht and his brother Ferdinand; the battle of Arcis sur Aube, in which the Bavarians under Wrede were engaged; and the granting of the Bavarian command to the Austrian general, Archduke Charles, in the battle of Sarnbruck, 1816, for the Hall of Victory (Sieges-Saal) in the state apartments of the new palace; and for the same patron of the arts, the departure of the Poles from their fatherland in 1831. These were followed, in 1830, in honor of the death of Gustavus Adolphus in the battle of Lützen, now in the King of Hanover's collection; in 1838, by George I. in the battle of Neerwinden; and in 1839, by the great camp in 1839 at Augsburg, for the Emperor Nicholas, at which that emperor was present. He painted besides these principal works many smaller pieces, which arc all conspicuous for extraordinary spirit in the incidents and in the execution, and display much fine drawing in colour and composition, though in many parts too sketchy and undefined; he wanted the necessary patience for elaborate modelling and uniform finish. But when the exact degree of this technical excellence is missed, its abstract form and absolute effect as a whole, and the general 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 only, universally regretted by all who knew him. Several of his works have been lithographed by Bodmer, Hanßtingel, and others.

(Kunstblatt, 1836-1844; Von Hornay, Geschichtliche Fresken in den Arkaden des Hofgartens zu München.)

MONTGOMERY, ALEXANDER, an old Scottish poet, was a younger son of a good family in Ayrshire. The Banter Myntsrcr, written in 1698, contains some of his
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. 'Catalogue of the plants in and belonging to the garden of San Domenico,' Bononiæ, 1719, 4to. 2. 'Indicies Horti Bononiensis ad Utum Demonstrantium quæ in Horto Bononiæ quodam tempore hactenus.' Bononiæ, 1724, 4to.

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 Angelo da Poggibonsi. He was first instructed by Andrea da Fiesole, with whom he lived three years. After the death of his father he found employment at Rome, at Pergamum, 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 and lasting friendship of the great Florentine. In 1521, at an interval between the affairs of the church and those of the State, he was called to Rome by Clement VII. to restore several ancient monuments, much to the dissatisfaction of his brothers of the Nunciata; 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 Coimo. 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 Turone, and advised by Michelangelo, to go to France, and with him to Paris, to Francis I., who commissioned him to make four great statues, but owing to difficulties with the treasurer and servants of the court in France's absence, Montorsoli left Paris and returned to Florence without executing his work. He was then employed by Pope Clement VIII., in good work, at the Basilica of Saint Mary of the Flower, and its neighbourhood, he went to Rome to Naples, and there constructed the tomb of Jacopo Sansavizzo. His next finished at Genoa the statue of Andrea Doria which was executed by his brother Domenico. He also worked in 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 aspects of the natural world related to the water element; it has become one of the usual meeting places and other dealers' centres for jetting the water: the whole fountain is crowned by a figure of Orion with the arms of Messina engraved upon his breast. The successful completion of this great work induced the Messinese people 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, and several tombs. Among other considerable works in architecture and in sculpture, towards 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 Santi, which he completed with great magnificence in twenty-eight months. He returned again to Florence, and being invited to be a sequester for artists in the chapter-house of the convent of the Nunciata, with the requisite endowment for regular masses at appointed times, and gave the whole sepulchre, the iron gates, and over the door, the picture of St. 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 Duke of Tuscany, in a firmer and permanent basis; and the society still subsists as the Academy of Florence, though since that time it has been considered enriched and endowed by successive Dukes of Tuscany. Montorsoli died at Massari, on the last day of August 1569, aged fifty-six.

(Massari, 'Vite de' Pittori, &c.')

MORCELLI, STEFANO ANTONIO, born at Chieri, near Brescia, in 1705; studied at Rome, entered the Order of the Jesuits, was sent to Ragusa, and afterwards returned to Rome, where he was made Professor of Rhetoric in the Roman College. After the suppression of the Order of the Jesuits in 1773, he became librarian to Cardinal Alessandro Albani, and then wrote his work 'De Stilo Inscriptionum Latinarum Libri III.,' Rome, 1781. In 1790 he was elected Prior of the Chapter of his native town, Chieri, where he amused himself in doing good to his townsmen, and for their sake he afterwards refused the see of Ragusa, which had been offered to him. He founded an institution for the gratuitous education of young girls; he gave in his life-time his own select library to the town, and was requested to supply the churches of the same town, and was very charitable towards the poor. He died at Chieri, in 1821. Besides his work on inscriptions already noticed, he wrote: 1. 'Inscriptiones Commentatorum Epigraphicorum,' Bologna, 1774; 2. 'Commentarii in Inscriptionium Novarum Basilicarum.' 3. 'A collection of Ecclesiastical Commentaries' published by a former inscriber of the same name. Morcelli translated the MSS. from Greek into Latin, adding his own comments, and rendering it a valuable work on church history. 4. 'Explanatio Ecclesiastica Sancti Gregorii.' This Gregory is one of the earliest bishops of Agrippinum. 5. 'Africa Christiana,' 3 vols., 4to., Brescia, 1816. This is another important work on church history, from A.D. 197 till A.D. 697. It may be styled the Paul of the Christian Churches in Northern Africa.

Morcelli's works on inscriptions have been collected and published together:—'Opera Epigraphica,' 5 vols., with plates, Padua, 1825-28, and Professor Schiavi has added to them a Latin Epigraphical Dictionary in Latin and Italian. Morcelli wrote also a book of epigrams, 'Elogia Literaria,' 12 vols.; and various dissertations on Roman antiquities.

(Morcelli, 'Storia della Letteratura Italiana.')

MORDVINIS, PIETRO, an Italian sculptor, worked at Rome in the reign of Sixtus V., and in 1590 went to Vienna, where he executed for the Emperor the monument of Euphorbus, who died in the battle of Belgrade.

MORELLI, Domenico, an Italian architect of considerable note among those of the last century, was born at Imola in 1732. He was the son of Domenico Morelli (an architect also), and succeeded his father in several works of merit at Imola. It was Morelli's good fortune to obtain powerful patronage at the very outset of his professional career,—first that of Gian-Carlo Pandi, bishop.
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 1774, with which Francis I., Pope the First, was extremely partial. 

It is true that Filippo Buonarroti, as well as Piacentini, were entitled to a personal regard for Morelli himself, almost immediately appointed him architect at Cesena (the pope's native town), and among various other commissions commonly connected with his designs for the city, the archdiocese of  

Yet as far as employment and number of works go, Morelli had no reason to complain,—rather to consider himself favoured beyond most of his contemporaries, as will appear from the enumeration of the chief structures illustrated 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 Barbiano, 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 A. Piacentini, Florence, 1771), Fermo in Pesaro; also the cathedral of Ferrara, which is confidently claimed for him by some, although Foschini was likewise in some manner or other employed upon it. [Foschini, P. C. S.] Besides the above works, he was employed at Bologna (St. Petronio), at Modena, the Berito at Naples, and the Cappi at Bologna; the façade of the Ricciotto at Cesena, and the Hospital at Imola, the façade of the Palazzo Publico, and the Palazzo Vecchio. He would probably discover more of the unrivalled structures of this class if we could see the finished copies of some of the engravings printed during his lifetime. 

He died, after a severe paralytic stroke, in February, 1812. (Pasotti, in Tipaldi’s Dizionario.)

MORELLI, GIA COMO, one of the most distinguished librarians of modern times, was born at Venice on the 14th of April, 1748. He was the son of poor parents, who were unable to give him a liberal education. It was against their 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, which he had to acquire for the benefit of the library of the family of the Zaniani, and his unwearied perseverance attracted the attention of the librarian de Rabais, who soon became his adviser and faithful friend. After having received from this learned patron of the arts, to his education, he acquired knowledge 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 Fasnetti, of whose rich collection of MSS. he published a catalogue, under the title of Biblioteca Manuscripta del Bali T. G. Fasnetti," Venice, 1771-80, 2 vols. 12mo. While this work was in course of publication he also wrote "Dissertazioni Storiche intorno alla Publica Libreria di Mess.T. Mansi, a Venezia, 1774," and solved a great many questions connected with the history of literature. He then prepared a similar work on the history of the library of the academy at Padua, whither he had accompanied his friend Fasnetti; but the materials which he collected for that purpose were unfortunately lost in the hands of Colle, the historiographer of that institution, through whose carelessness they were lost. In 1776 he published a catalogue of his MSS. of the Narni family; and somewhat later a catalogue of the MSS. of Italian works contained in the same library. These works alone would have sufficed to secure to Morelli an elevated position, as they gave a valuable knowledge of the library from its venerable ancient building to a new one, the splendour and convenience of which however conspired to render him some measure of the loss of the former building. In 1795 he published an enlarged catalogue and description of the library, with the purchase of Dion Cassius, which he published at Basso, together with new various readings of other books of the same historian. This little work was afterwards (in 1800) republished at Paris, under the title of "Antichi Eruditi," in which he exhibited his extensive knowledge and his critical acumen in the strongest light is his "Biblioteca Manuscripta Graeca et Latina," of which however only one volume was published at Rome, although he had collected materials for several more volumes. His last production was "Epistolae Septemvaria Eruditionis," Padua, 1819. Abbé Morelli is acknowledged by all who had 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 extra-ordinary modesty. After his death there appeared, "Operette osservazioni su Opuscoli di Antichi SCRITTORI," Venice, 1820, 3 vols. 8vo. 

(Bettio, Orazione recitata nelle soleone Esequie nella Chiesa Patriarciale di Venezia, Venice, 1819.)

MORGEN, RAPHAEL SANZIO, Cavalieri, one of the most celebrated engravers of recent times, was born at Florence, June 19, 1728, by his own account, according to the authority of Niccolo Palmarini, his pupil, who published a complete catalogue of his works. 

Morgen's grandfather was a lace-merchant of Montpellier, who married a woman of the same name, who was settled in Florence, where he had two sons, Filippo and Giovanni. They both followed the arts: Filippo, the elder, and the father of the subject of this notice, was an engraver. He settled early in Naples, and married a French lady, who degenerated, in 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 dismissed, to be re-appointed in 1815, when the new papacy were treated with great personal regard for Morelli himself, almost immediately appointed him architect at Cesena (the pope's native town), and among various other commissions commonly connected with his designs for the city, the archdiocese of...
Philipp must have made a visit with his wife to Florence some time after his marriage, and before the birth of Raphael, as it is founded as an engraving in the second print. Of the second print there are eight different kinds of impressions:—etchings, in five degrees of progress, in which additional portions are finished; fifteen impressions in which all is finished, but the book in the handwriting of Andrea Doria, the degree of progress, with the inscription, 'Et transfiguratus est ante eos,' written with the needle; and, lastly, the commissionately finished proofs. This engraving is a work of great labour, of great skill, of a very extraordinary execution of the lines goes, yet it leaves much to be desired; it wants tone and aerial perspective, it is hard and metallic, red, all, as when, though the individual figures are beautified, but the whole, is cast-away from the catalogue. Dr. Nagler has reprinted the list entire in his Roman Lexicon.

MORHOF, DANIEL GEORGE, is well known as the author of a very useful work, entitled 'Of the History of the Gunpowder, &c.' After his father, extending to 78 closely printed quarto pages, is prefixed under the title of 'Prolegomena,' to the second volume of that work, by the editor, John Moller, rector of the grammar-school of Flensburg in Schleswig. From this copious dissertation it appears that Morhof was born at Wismar, in the duchy of Mecklenburg-Schwerin, on the 6th of February, 1699. His father was Joachim Morhof, notaary public, assistant-clerk to the town-council (Senator urban Lip; just in the City), who had been of humble parentage in the Mark of Brandenburg, and is described as distinguished both for his prosthesis and his learning; his mother was Agnes, daughter of Daniel Hintz, a respectable merchant. Young Morhof was taught his Latin rudiments at home by his father, who also made him early familiar with the Bible and with the elements of general history. Before he knew his alphabet he was fond of muscular exercises, and he was distinguished for his precocity and rapid progress. When he was in due time sent to the Athenaeum, or academy, of his native town, he distinguished himself not only in Latin and Greek, but in history and in the mathematical sciences, and in 1656, he received the degree of M.A. He was next assigned to the Paedagogium of Stettin; whence after two years he proceeded to the university of Rostock to study law. He continued however to give a great share of his time to elegant literature, and especially to poetry, composing verses both in Latin and German with great facility and much to the admiration of his friends. In 1660 he obtained the professorship of poetry in the university. In the beginning of the same year, before commencing his public prelections, he visited Holland and England, remaining for some time in this country that he might have the use of the Bodleian Library. He also addressed a petition to the king in behalf of the German printers and engravers. On his return to the Continent he was made doctor of laws by the University of Franeker, in Friesland, on the 26th of September, 1661. He greatly distinguished himself by the manner in which he defended the duties of his profession. In 1666 he was invited and induced to accept the appointment of Public Doctor of Eloquence and Poetry in the newly founded university of Kiel in Holstein. In the summer of 1670 he made another dramatic tour, this time to Syria, Egypt, and Italy, and 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 23rd of September, he fell sick, and died at Copenhagen, on the 26th Caspar a Degen, senator of Udine, of the plague. She died in 1687, after having brought him four sons; of whom the second,
George Marquard, and the fourth, Eric George, died young; the first, Caspar Daniel, and the third, Frederic, survived their father. In 1580 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 break down. In 1650 he was attacked by a serious illness, and it really seemed for a time as if the following year he would undertake an ill-advised journey to the mineral waters of Pyrmont, from which he never returned: he only got back as far as Lübeck, and there breathed his last, on March 2, 1668, 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 Möller. His first production consisted of two Latin poems, published together in 1527. This was followed by an academical dissertation entitled 'Dias tribus monibus et eorum Remedia Juridica,' in 1569; and afterwards, among other works, by an octavo volume entitled 'Epigrammatum et Jocorum Centuria Prima,' in 1569; 'Dias tribus Philologicae de Novo Anno ejusque Ritibus,' in 1568; a curious dissertation of the miraculous powers claimed by the kings of England and France in the cure of the king's evil, under the title of 'Principis Medicus,' in 1565; a volume of 'Miscellanea Poetica,' in 1566; another entitled 'Vencrum, sive Epitaphianlunmar, Liber,' in 1567; another entitled 'Fune raria,' in 1568; a volume of verse at various times; a translation into Latin of several of Boyle's tracts, in 1671; 'Disputatio de Sole Ignea Academicca,' in 1672; in 1673 'Epitaphi de Transmutatione Metal. legum,' with a Latin dedication to Senex, evidently that of the philosopher's stone; in 1692, an 8vo volume, in German, on the history of the German language and poetry ('Unterricht von der Deutschen Sprache und Poesie, &c.,') with a collection of his own German verses ('Sussnere Gedichte'); in 1684, 'Liber de Pataviniat Liviana'; in 1686, 'Oitiron Divinorum, seu Carmina Sacrorum, Liber,' and the first and second books of his 'Polyhistor,' in 1688. After his death appeared, among other works, in 1694, 'De Cultu Morhoffi CVIII, Quaestiones Chymicae, ex varia Autoribus Chymicis collectae; in 1697, 'Morfobii Opera Poetica Latina omnia,' in 1698, 'Morfobii Orationes et Programmata;' in 1699, 'Morfobii Dissertationes Academicae et Epistolae.' For the works which he left in manuscript, mostly in an unfinished state, and which have never been printed, we must refer to the ample 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 acquirements; and even his imagination was quite as remarkable in extent as for its depth. Of all the masses of authorship to which his name is attached, his 'Polyhistor' is, we believe, the only portion that is still held in any esteem. The work is 'Polyhistor Literarum, Philosophiæ, et Practicarum.' Of the 'Polyhistor Literarum,' 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 588 pages. A Third Book, entitled 'Papæ et Sacerdotum,' was printed from Morhof's manuscript at Lübeck in 1692, with a re-impression of the two preceding Books. It extends to 156 pages. The remainder of the first volume, consisting of Book iv., entitled 'Grammaticæ,' (306 pp.); Book v., entitled 'Criticæ,' (20 pp.); Book vi., entitled 'Poetica' (72 pp.), was compiled from notes of Morhof's lectures, by Moller and John Friekius, professor of theology at Ulm; they also added the 'Polyhistor Philosophica,' in Five Books; and the 'Polyhistor Practica,' in Seven Books; and published the completed work in two vols. 4to. in 1704. A new edition of the whole work was produced in two vols. 4to., by John Albert Fabrius, in 1751; as well as a 12mo. 4to. in 1754. All the editions have been published at Lübeck. With the ample indices which Fabrius has appended (though the plan of notation is rather complicated), and with the corrections and additions which he has received from an 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. MORO, ANTONIO, or Sir Anthony More, was born at Utrecht, in the year 1526, and was the pupil of Joan Schoorlac. He obtained, while still young, a great reputation at Rome, especially as a portrait painter, and when the Emperor Charles V. requested the Cardinal Granvelle to send a painter to Madrid to execute a portrait of the King, the cardinal selected More. He was introduced to the Emperor, at Madrid, in 1552, painted Philip's portrait there, and, at Lisbon, painted besides the Infanta Mary, King John IV., and Queen Catharine of Portugal; for which he received 600 ducats and a very valuable gold chain as a present. Van Mander says that his usual price for 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 allotted 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 that time, some of which are at Hampton Court, and many others are still in the private collections of the descendants of the families. Some of his works, however, were never painted. More was 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 of which there was a great amount of curiosity, he declared that he believed the king to have made his second marriage with his open hand on the shoulder, the painter ventured to return a blow with his mahlstick, but he soon repented of his familiarity, and was heartily glad to escape with temporary banishment. Philip, however, sent to recall 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, but, through the Dutch Ambassadour, as a subject of Spain, gave him a salary of 150, and allowed him to paint in Madrid. Van Mander says that More had 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 he declined, that he made a hundred 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 1581, 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, which were, however, often bought by pieces by him, but they are 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, Hel Leem der Schilders, &c., 1674.) MORONI, GIAMBATTISTA, a celebrated Italian historical and landscape painter, was born about 1510, at Albino in the territory of Bergamo, and was the scholar of Moretto da Brescia, whom he did not equal in invention, but surpassed as a portrait painter. In this last branch he was inferior to Titian only in his time, and that great master had to be repeatedly recommended applicants to go to Moroni. The heads and draperies of his portraits are beautiful; the hands might be improved. In his historical pieces he belongs rather to another age. His later works are almost valueless. In 1786 the date of his death is not known, but his works range, according to Count Tassi, from 1557 to 1579. (Tassi, Vite de' Pittori Bergamaschi, &c.; Lanz, Storia Fittoriciana.) MORPETH, a municipal and parliamentary borough in the township and parish of Morpeth, in the western division of Morpeth ward, in the county of Northumberland; 302
miles from the General Post-office, London, by the former mail-coach road through Ware, Huntingdon, Grantham, Newark, Doncaster, York, Thirsk, Northallerton, Durham, and Newcastle-upon-Tyne; or 331 miles—namely, 307 miles by rail (regular stage, 13 hours and 15 minutes). There is a regular stage from London to Edinburgh. The parish of Morpeth comprehends an area of 7600 acres, and is partly in the east and west divisions of Castle ward, and partly in the north and south divisions of Morpeth ward. The population at the different enumerations in the present century was as follows:—1801, 5707; 1811, 4098; 1821, 4292; 1831, 4797; 1841, 4297. It is divided into six townships ;—Morpeth Town, (the latter having Catchburn and Stobhill united with it), in the east division of Castle ward; Newminster Abbey, Shilvington, Tranfield and Highchurch; and Twissel in the west division of the same ward; and Morpeth and Beller's-green in the west division of Morpeth ward. The boundaries of the municipal borough include about half of the area, and nearly all the population of Morpeth town, and a small part of the township of Newminster Abbey; the town is chiefly in the borough, but a portion of it is in the township of Beller's Green. The number of houses and persons in these two township-houses coincides with the number of houses and population of the town. The return in 1831 and 1841 were as follows:—

<table>
<thead>
<tr>
<th>Population</th>
<th>Houses</th>
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<tr>
<td>1831</td>
<td>2527</td>
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<td>1841</td>
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The diminution of the population, 483, or nearly 12 per cent., in ten years, and the circumstance that there were no houses building in 1841, show the decline which had taken place. The parliamentary borough was described by the Boundary Act, 1832, as consisting of the parish of Morpeth, excepting the townships of Shilvington and Twissel (population of the two 151 in 1831, 137 in 1841), and the adjacent parish of Bedlington, or Bedlingtonshire (population in 1831, 2120; in 1841, 3165), a detached portion of the county of Durham. The population of the parliamentary borough in 1831 was therefore 6766; and in 1841, 7255.

Morpeth town stands in a sort of peninsula formed by the windings of the river Wanebeck, which surrounds the town on the west, south, and east side, but is not navigable. The road from Newcastle enters the town from the south by an elegant trim bridge over the river, erected by the designs of Mr. Telford, and there is a suspension bridge on the west side. The streets are irregularly laid out, and, when the Municipal Corporations' Commissioners made their report in 1835, they observed that they were not generally improved, and were not in fact quite paved with pebbles, but in 1838 the pavement was taken up and the streets macadamised, to the great comfort of the townsmen and travellers. The town is supplied with water from a spring at Stob-hill. There are not many good houses in the town. The church is nearly half a mile from the town, on the south side of the river: it is in the style of the fourteenth century, and consists of a nave and chancel, and a western tower, engaged with the nave: few old churches are more destitute of objects of interest, architectural or antiquarian. In the spacious churchyard is an ancient octagonal cross, but little injured. In the town, close to the bridge which is a mile as the crow flies from the grammar-school, and part is still used as a chapel-of-ease for performance of divine service. In a suburb of the town, on the south side of the bridge, on the east side of the road, is a good and house of correction for the county, erected about twenty years since, at a cost of 70,000/. It is an octagonal building, entirely of stone, in a dry and elevated site. The average number of prisoners in the year 1842 was 25, and a total at any given time has been about 40. The principal part of the building is used for stock-pieces at almost every theatre where there is any regular European performances. Near the opposite side of the road, are the remains of Morpeth Castle, a rude and strong building, of which the gateway-house and the outer wall, now much shattered, are still standing; the area enclosed by them, 92 yards by 68, is occupied as a nursery-ground. The townhall, a building by Sir John Vanburgh, was used as a sessions-house until the erection of the present gaol. There are a Roman Catholic chapel; and meeting-houses for Presbyterians, Independents, Methodists, and Morpeth Baptist, and a quaker meeting-house. The antiquary, author of 'Britannia Romana,' was minister of the Presbyterian congregation from 1723 till his death in 1731, at the age of forty-six. The trade of Morpeth is chiefly that of much of the north of England and the north of Scotland; but there is a good weekly market on Tuesdays for live stock on Wednesday: the weekly sale of oxen is 100; of sheep and lambs, 300. There are a dispensary, a savings-bank, a subscription library, and a Mechanical and Technical Institute. The grammar-school was opened the first 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 Municipal 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 members to parliament in 1653. 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 from the existing municipal boundary to the extent already described. The number of registered electors was in 1835-6, 554; in 1839-40, 583; 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; and in 1731, a fair was entered on the corporation by John A. J. Hodgson, 'for the fair and market, the horse-race, and the barons.' In the civil war of Charles I., Morpeth Castle was occupied by a body of the Scotch Covenanters, from whom it was taken in 1644 by the Marquis of Montrose. The late Dr. Morrison, the eminent Chinese scholar, was a native 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 rectorcy, with the perpetual curacy of Uppington, and the vicarage of the archdeaconry of Lindisfarne, in the diocese of Durham: the annual value of the benefice is 111l., with a glebe-house.

There were in the borough in 1838 thirteen day-schools with 448 to 468 scholars, viz. 260 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 V.: two others were supported by the corporation. There were four Sunday-schools with 464 scholars, viz. 209 boys and 255 girls. Lending libraries are attached to two Sunday-schools; one (that of the Church school) is for the general use of the parish. A library of little value is attached to the grammar-school.

(Parliamentary Papers; Hodgson, History of Northumberland.)

MORTON, THOMAS, was born in 1764, in the county of Durham. His parents having died while he was young, his uncle, Mr. Maddison, a stockbroker in London, took him into his care. He was educated at the Soho Square Academy, celebrated for its theatrical performances of the pupils, several of whom became distinguished actors. He 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 the law. Having written a dramatic piece which was favourably received, he abandoned the legal profession without having been called to the bar.

Morton thenceforward devoted himself entirely to play-writing, and became one of the most successful of modern dramatists. So great was his reputation and the confidence of managers in him, that he was commissioned to write for the Old Covent Garden Theatre, and his comedy of 'Town and Country' was to be brought out in 1807. Mr. Harris, the lessee of Covent-Garden Theatre, gave him 1000/ for it before the play was to be produced. But, afterwards, taking on himself all risk of failure, out of fourteen or fifteen comedies, comic-operas, and farces, five or six still continue to be stock-pieces at almost every theatre where they are met with.
Morton was a respectable man, of regular and orderly habits. His conversation was sprightly, and abounded in anecdotes of cricket and other sporting matters. He was a conspicuous and meritorious 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.

The portrait of Inchbald, on which he is seen playing only by reading him, his uniform and great success will probably matter of surprise; to those who are engaged in dramatic writing, it must be no less a matter for investigation. Morton has a happy gift of imitating the impression of a great man, 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, abounding in episodes and transitions, and brimming with 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. Mr. Morton has not wit and elegance, but is never languid or heavy; and the very speeches which when read produce a smile of contempt or a feeling of incredulous disgust, afloat to Lewis, Munoden, Quick, Fawcett, and John Saunders, and W. Vernon, who was the painter by which they were enabled to exhibit the triumphs of the actor. (Gentleman's Magazine, 1838; Biographia Dramatica, by H. Reed and J. Jones; Inechilt'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 chaser in gold and also of brass for the ornaments of cabinet-work, in which he obtained a great reputation. He was also an excellent medalist 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 for some years kept by Sir Christopher Wren, who was an old friend of his, and who appointed him body-chaser for the Royal Academy of Arts. In 1768, he was elected 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 Malone's Life of Sir Joshua. As a chaser in gold, says Sir Joshua, Mozer 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 Britons.' Hogarth, Rysbruck, Roullilac, Willis, Ellis, and Vanderbank, were Mozer's early companions, all of whom he outlived.

Mary Mozer decorated an entire room with flowers at Frogmore for Queen Charlotte, for which she received 300l.; the room was called Miss Mozer's room. After her marriage she practised only as an amateur; she died at an advanced age in 1819. When West was reinstated in the chair of president of the Royal Academy, he secured the appointment of Sir Joshua Reynolds, whose name is a synonym in art for the true artist, a man of great and far-reaching powers. Sir Joshua Reynolds was a man of great and far-reaching powers. Sir Joshua Reynolds was a man of great and far-reaching powers. Sir Joshua Reynolds was a man of great and far-reaching powers.
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
these savannahs is light, loam mixed with a large propor-
tion of black mould. The higher ground, especially near
the banks of the river, and the lagunes, have a large mixture
of sand, and these trees are mostly overgrown with pitch-
pine, which in other places in the interior are composed of
dry impregnated sand mixed with mould, and in the woods which cover them a
large number of mahogany-trees, cocoa-trees, cacteouchouc,
and other valuable trees are met with.

The whole country, as far as it 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 rainy season, and when the waters decrease
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 freshets, but are soon replaced by
other blocks, which, however, are only accessible to small vessels,
so that 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 five fathoms of water. As they enter these
rivers, which falls into the lagune of the same name (12°
N. lat.), and is said to run upwards of ninety miles, rises
within the state of Nicaragua. Wanks or Segovia River also
rises in the interior, and joins the Rio de la Segovia, 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
bay. 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, fre-
quently several streams, and therefore a current is always
observable, which sometimes runs strongly. Near the entrance
of the lagunes the water is brackish, but in the interior, and especially the
springs, it is sweet. The trees which rise in these
lagunes form good harbours, but towards the
middle of the dry season barcts are found across the entrance,
which however have much more water than the bars of the
rivers. Owing to this circumstance, and because the lagunes
do not exale any dangerous vapours, the settlements
have generally been made on their banks. The most extensive,
from south to north, are Biewfield Lagune, into which the
Biewfield 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,
which is six miles long, and from sixteen to twenty miles
wide; the bay at the Cape Gracias a Dios, which is of small
dimensions, being only four miles long and three wide, but
which forms a good harbour, with 22 feet water at the
entrance and 20 feet in the interior, and excellent anchoring
ground; and Cardiaskia 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, but it extends to the tongue of land
which separates the lagune from the sea, which changes
from two fathoms to two and a half deep. Four rivers of
moderate size fall into this lagune.

The Mosquito coast resembles that of Jamaica,
in having two wet and two dry seasons, but they do not
occur exactly in the same months, and differ somewhat
in character. The autumnal rains, which in Jamaica
continue in October and November, continue on the coast for
four months, from November to February. They are heaviest
in December, but even in that month only descends in
showers: continual rains for twenty-four hours are of rare
occurrence. The first dry season, about the middle of
August, is not so dry as in Jamaica, where they
sometimes continue for several days and nights without inter-
mission. On the coast the rains are heavy, but very short;
they however attended by very thunder-storms. From
the commencement of August to the middle of October is the
second dry season, in which only light showers occur at the
beginning and towards the end of the season. The rainy
months are November, December, January, and February.
The dry months March, April, May, August, and September;
and those in which showers alternate with dry weather,
October, February, and June. The annual amount of rain
which falls has not been ascertained, but it is certain that it
exceeds the average of Europe, though the number of rainy
days is not so large. In the coldest months (from September
to February) the temperature varies between 66° and 70°,
and descends occasionally to 60°, and even to 50°. In the
three following months it varies between 70° and 80°,
and rarely rises higher. In summer the thermometer ranges
between 75° and 84°, sometimes rising to 86°. In autumn the
range is between 70° and 66°. The temperature of the air in the
day and night is very small. The eastern trade-winds, not being stopped by mountain-
ranges near the shore, but passing over the inclined plane
of the coast, blow for three months without interruption.
There are occasional easterly fogs, and a light sea-breeze
which exists on the sea. To this circumstance, and to the
abundance of stagnant waters, the comparatively great salu-
arity of the climate is to be attributed, which is confirmed by
all modern travellers who have resided in the country, though contrary statements have been made
by modern writers. During the long rains (November to
February) northern winds prevail, but from the middle of
February they change to the south, and the general winds settle at the end of March, and during the three following
months they blow with considerable force. In August and
September they are light, variable, and interrupted by calms;
and in October the wind passes between east and north, until
it settles entirely in the last quarter. Dew is not frequent,
and never heavy, but the thunder-storms are sometimes
terrific. Hurricanes are not experienced, nor does it appear
that earthquakes, even of a slight kind, have occurred, though
most of the surrounding countries are frequently visited by
them, especially Guatemala.

Vegetation is as vigorous as in any country between the
equator and the Tropic of Capricorn. The principal trees are clad often
a height of five or six feet. The number of vege-
tables which are cultivated with success is great; the most
common are plantains, bananas, arrow-root, Indian corn, kola,
african tobacco, cacao, potato, tapioca, the different
kinds of palm, cotton, cassava or mandioc. Coffee, cocoa-nut trees, palm-
ioil 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 tree, cabb-
bage tree, fan palm tree, cacteouchouc tree, avocado pear,
pimento tree, live oak, sepulchre tree, papaya tree, calabash
tree, mamey tree, guava tree, mango tree, cano tree, silk
cotton tree, mahogany tree, cedrella, yellow-wood tree, iron-
wood tree, dog-wood, ebo tree, cashew tree, lassa tree,
guaciao tree, pock wood, rosewood tree, the caracar oil plant,
brasiliare tree, the acajou, or true ironwood, the puiti oil
plant is found wild; vanilla and saracapella 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 abond,
but they are not large; asses, sheep, and goats are not
kept, but hogs are abundant. Fowls are numerous. Several
kinds of monkeys are found in the woods, and in the
different rivers, where also the jaguar and the tiger-cat are met with.
Other animals are the racoon, the opossum, grey squirrels,
deer, and the marmot. Alligators are found near the embou-
ches of all the rivers. Lizards are very numerous, and
are distinguished by its size, and is eaten by the natives. There
are several kinds of snakes, which of these are said to be
poisonous. The land-turtles belong to the species Testudo
tabulatae, and are sometimes more than a foot long, but their
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 the Cayman Islands. At the Cayman Islands there is a resort, where they take especially green turtles (Chelonia mydas) and hawks-bills (Chelonia caretta). The birds are imperfectly known. Among them are different kinds of pelicans (Pelecanus aquatorialis), humming birds, the black vulture or John crow (Cathartes adamsi), and several kinds of pigeons. Several kinds of ducks and the pelican (Pelecanus antiquorum) have been noticed. Fish is abundant in the lagunes and rivers. Fifteen species 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 there are also rays. No shell-fish have been noticed, except the oysters. Crabs, crawfishes, and some kinds of lobsters are frequently met with. Honey is frequently used as sugar. Mosquitoes are not common, which is ascribed to the strong winds that generally blow. Sand-sies, sand-dies, and centipedes (Scolopendra morbitana) are common.

The majority of the inhabitants do not materially differ from the other savage tribes of America. But the ruling tribe, called Sambos, show evidently a strong mixture with the negro. The colour of the other tribes is a clear brown; but that of the Sambos is much darker, approaching sometimes to black; and whilst the black hair of the former is lank, that of the latter is curly. In some cases the Sambos 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 killed with muskets, and the negro women were carried away. Among them are also a few Caribbees, probably the descendants of those who, in 1797, were sent from the isle of Dominica to that of Roatan, and who afterwards emigrated to the continent of America. They are short 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 use of the châtelaine, 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 dorés, 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 have frequently earned the praise of English naval officers, who have traded with 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 English families which are settled there. They receive English goods in exchange for the produce of the soil, and also by vessels sent from Jamaica and other 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 indifferent guns, gunpowder, balls and shot, some cutting instruments, as axes, knives, blades, iron kitchen utensils, fishing-hooks, glass bowels, gossamer hats, American tobacco, pipes, flints, girdles, bowls, and mugs of earthenware, rum, brandy, and liqueurs. These articles are exchanged for cattle, especially cows, turtle-shell, hides and horns, sarsaparilla, vanilla, the sauchou, gummi, casco, pimento, castor-oil-nuts, mahogany, fruit, and some articles from the central American states: as cochineal, silver, gold-dust, and silver and gold coins. They demand in return the commodities of the United States and Spain, and some intercourse with Honduras and Nicaragua.

This coast was one of the first places where the Spaniards tried to establish a settlement. Alonso de Ojeda and Diego de Nicuesa, on an expedition to the coast of 1512, which was short, the adventurous; 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 English and other European countries commenced trade, they had submitted to Davila (1522), and Pedro Alvarado (1523), the Spaniards again tried their arms against the natives; but they were not successful. They sent there in the seventeenth century several misadventures, some of whom died the death of martyrs. All those 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 Mosquito with some circumspection, and the Spaniards in the country as the safest retreat when they were pursued by the buccaneers. By means of the buccaneers it appears they were brought into connection with the English, and the old colony was again revived. This was confirmed by a treaty in 1670. The first settlement of Englishmen on this coast dates from 1730, when some families established themselves at Cape Gracias a Dios on Black River and at Blythewode's River. As these settlements soon acquired a certain degree of prosperity, especially by smuggling with the inhabitants of the Spanish colonies, the English government sent there some persons invested with authority, and erected a few small forts. The settlers were engaged to abandon these forts and to compel the colonists to leave the country. This was done, but several families established on Blythewode's Lagoon did not obey the order of the 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, and induced the Spaniards to cede it, and in 1783 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 at this time that the English first created the town of Falmouth and Port Royal, and 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 those which are situated between Punta Gorda and the Laguna of Chiquila.

Meanwhile the king, whose power is absolute, has ceded different districts with almost sovereign power to some Englishmen, who have formed settlements on the island of Great Inagua, 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, especially as 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.; Roberts's 'Narratives of Voyages and Excurions on the East Coast and the Interoceania'; Young's 'Narrative of a Residence on the Mosquito Coast during 1830-1841'; and Bericht über die Untersuchung einer Theile des Mosquitoaldeas von der dazu ernannten Commis- sion of the 21st July, 1832.]

MOUFLON [Sheep, P. C.]

MOVING POWERS. The means employed to give motion to machinery, independently of the cases in which the force of gravity is used (such as ships upon rivers, and the pendulum 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 proposed actions of the galvanic fluid and of fixed 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. 475 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, cast 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, a car, &c., are resisted, expressed in pounds, through a certain number of miles during a working day and the continued product of the weight, the distance, and the time has been made to denote the intensity of the power, one pound being one foot, one mile the distance, and one hour that of time; in estimating the action of an engine or machine it is usual to consider one foot as the unit of distance and one minute as the unit of time, one pound being the weight, and Nicoli's relation, the action of the power, is, moreover, supposed to be continued during all the time that the machine is at work.

Originally the large kind of engines, except such as were impelled by wind or water, were moved by the power of horses; and when other agents were employed, the gross effect of the
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MUC

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 universal unit, Means, 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 lbs. (i.e. 125 X 3 X 8) drawn or raised one mile in 8 hours; or, multiplying by 5290, the measure is 15,640,000 lbs. raised one foot in an equal time. This product, being divided by the number of minutes in 8 hours, gives the rate of the centre of percussion to the vessel at each stroke; and hence, when raised 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 38,000 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 reaction of water against the paddles of a steam-boat may be more or less 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, &c., see Steam-Engine, P. C. F.

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 the 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 the force of water on the paddles or flat-boards 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 since the vessel will move forward 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 D, 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 $\overrightarrow{B D}$ while the movement of the vessel is $\overrightarrow{E F}$ (i.e. $\overrightarrow{D}$); and therefore $\overrightarrow{B D}$ represents the relative movement of B. The lines $\overrightarrow{B D}$ and $\overrightarrow{D}$ being proportional to the velocities of the oar and vessel, we may represent by $\mathbf{a}$ and $\mathbf{v}$; $\mathbf{e} - \mathbf{v}$ will express the relative velocity of the oar, and the effective power of the latter will vary with $(\mathbf{v} - \mathbf{e})^2$. Let $\alpha$, in square feet, be the area of the blade of the oar, and let the pressure of water against a square foot of surface be 18 lbs. when the velocity of the water is 1 foot per second; then $\frac{1}{2}(\mathbf{v} - \mathbf{e})^2$ will denote the force of the oar.

If, for simplicity, the prow of the vessel be supposed to have the form of a wedge with plane faces meeting in a vertical line, or cutting water, on putting $\mathbf{a}$ 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

$$\frac{1}{2} \alpha \sin \theta \mathbf{v}^2$$

for the resistance of the water against the prow. Therefore, $n$ being the number of oars all of which are supposed to act with equal forces; we have, when the vessel has acquired a terminal velocity,

$$\alpha = \frac{1}{2} n (\mathbf{v} - \mathbf{e})^2 \sin \theta \mathbf{v}^2,$$

from which $\mathbf{v}$ 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 vessel thereby gains. Some force, however, is lost 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, nearly, the value of $\mathbf{n}$, 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 $\mathbf{e}$ would be, of course, determined by the revolutions with which the paddle-wheel is turned, at 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 axis.

The momentum of water flowing horizontally against a plane, such as a flat-board 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, in a given time. The weight of water, 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 that height, expresses the power of the water in force. In experiments Mr. Smeeaton 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 undershot 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 such a wheel as one compounded of an undershot and a breast-wheel; and the effective power of the latter 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 point at which the water impinges on the breast-wheel. The height of water above the 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.]

MUCIUS SCAEVOLA. [SCAVEOLA, P. C.]

MUCUNA, a genus of plants belonging to the natural order Leguminosae. The calyx is campanulate bilabiate, with two very caducous bracteae as long as the tube; the upper lip broad, entire, and obtuse; the lower lip trifid, with acute segments. The corolla is papillose-lobate, with a corotiate vexillum incumbent on the wings, much shorter than the wings and the keel, and without callosities. The stamens are diadelphous, with five of the androecium 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 herbs, with pinnate or palmate leaves and axillary racemes, which hang down bearing fruit.

M. pruriia, Cowitch, has purple flowers in compact ovate racemes, leaflets hairy beneath, the middle one rhomboidal and obtuse, the lateral one dilated or ovate. The legumes are oblong, curved, compressed, not keeled, and covered all over with a thick coating of erect, white, stinging hairs, which turn black in drying and brown when ripe. It is a native of India, and found also in the western portions of the United States.

M. pruriens, 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

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Cotton syrup, the...
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 Mengoni, to whose works he clearly may compare, and his edition of Droysen's 'The Greek and Latin' (Leipzig, 1833, 4to.), and his monograph of Thucydides (Leipzig, 1833, 8vo.), and of the Eumenides 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. His activity in Greece was of very great assistance to him, in 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 of Athens, posthumously taking 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 theorize and generalize on insufficient grounds. But in extent of knowledge and reading there scarcely ever was a scholar who surpassed him.

MüLLER, WILLIAM JOHN, one of the best of the English landscapists, was born in London, the son of his father at Bristol, in 1812; his father was curator of the Bristol Museum. Müller's first instructor in art was the landscape painter J. B. Pyne, likewise a native of Bristol, but he owed his excellence to his instructor, the great Grünewald, and, and his great teacher was nature: he found an early and valuable patron in Mr. Acrman, of Clifton, for whom he painted many pictures. In 1835 and 1836 he made a tour upon the Continent, in which he gathered to himself all the many admirable sketches. Sketching from nature was a department of art in which Müller had extraordinary power; 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 1836 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 1855 he started upon a long and archaous tour through Greece and Egypt, and visited the important sculptures and paintings, and visited the mummy-caves of Mahadhibes, of which and many other interesting places in Greece and Egypt he made masterly drawings. He returned to England towards the close of 1839, by the Cretan coast, and to this period 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 at Gournia in Egypt at Sunset, 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 so high; it is a master-piece of colour and effect, and is certain a work of high poetic art. The view of Athens is equally excellent in its class; the picturesque, and at the same time the historical associations 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 moity of the attention which they deserved, was laterly purchased by a picture-dealer for nearly ten times the amount, and was sold for twenty-four guineas: ten times the amount is nearer its present value also.

In 1846 Müller joined on his own account Sir Charles Fellowes on his expedition to Lycia, to remove to London the Xanthian marbles, now in the British Museum. He returned to London in 1844 with some dozen of very interesting and masterly sketches, which elicited the unqualified admiration of all who saw them at the Society. Leaving 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
4800, a small sketch of his own apartment at Macri alone fetched sixty-five guineas. These are curious facts: he himself receives only thirty guineas for his picture of Athens, a finished work. He finds it, he says, far better to employ a footman, and be 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 price. The living work would appear to be more worth the shadow of his own body when dead.

The pictures, the fruits of Müller's second tour, which were exhibited at the Royal Academy in 1844, appear to be the principal causes of his death. After the early failure and unexpected death, though the fatal results of their bad hanging on the Academy walls betray an extraordinary degree of sensitiveness in the painter. He appears from his own words to have anticipated such a result. He speaks of a violent protest against the exhibition of these works in the Academy; far indeed however was the result from the anticipation. Müller 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 Chinari, Xanthus; The Burial-ground, Smyrna; Tent Scene, Cingaries playing to a Turkish family, Xanthus; and Turkish Merchants with Cannels passing the river Manganese, in the valley of Xanthus. These 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 or could not be seen, and might have been altogether spared over by the majority of visitors to the exhibition. Müller felt this condemnation excessively, and notwithstanding his own professed resignation to his fate, he was evidently aggrieved at the alteration. These pictures were exhibited in all the month of May, which ended fatally at Bristol, on the 5th of September following. He died from enlargement of the left ventricle of the heart, and several of his friends have not hesitated to declare that the humping committee of 1845 killed William Müller. 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 country, he risks other and distant climates, spends 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. . . . Such has been the reward I have received for the expenditure of large sums, of great labour, the risk of loss, the expectation of a time-consuming and exhausting 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 the letters are published in the 'Art Journal,' 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.

Müller exhibited several pictures at the British Institution, among which were, in 1845, a View of Rhodes with the Basha's Palace, and a Dane at Xanthus. He exhibited also many excellent landscapes in the early part of his career at Bristol; and, besides what has been already mentioned, the following works at the Royal Academy: —In 1841, Sketch of a sand-bank off the coast of Gibraltar; Copy of a drawing by the Sphinx: in 1843, Arabs seeking Treasure; Prayers in the Desert; and Welsh Mill on the Dolgarey. He published in 1841 a beautiful work entitled 'Pictureque Sketches of the Age.' This is an entire series of his Sketches in the East will also shortly be published.

MUN, THOMAS, is the name of an English writer on political economy, who lived in the earlier part of the seventeenth century. Some of whose writings appear to be known. His best known work, a small octavo volume, published at London in 1664, is entitled 'England's Treasure by Foreign Trade,' or, the Balance of our Foreign Trade is sotrecht, and the rate of it will be the rule of our great. Thomas Mun of London, merchant, and now published for the common good by his son John Mun of Beartsted, in the county of Kent, Easre. 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 and will not desert. To these Mun gratefully dedicates his book, and to his lordship, and to the public. Mun is a name well known amongst merchants, and well known to most men of business for his general experience in affairs, and valuable insight into trade. . . . There is little probability that he was the same man who observed that Ferdinand I, the Grand Duke of Tuscany, was very rich in treasure, and enlarged his trade by lending to merchants a great sum of money at a low interest, he adds: — Myself, I have heard the story of his munificence; although he knew that I would presentily 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 dwitting 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, and myself 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 Commerce,' has not observed that 'probably Mr. Mun was in Leghorn at that time and may have written his book about 1600.' The conjecture of Mr. M'Culloch ('Principles of Political Economy,' p. 30), that at the time when Mun wrote his book, 1629 or 1640, is likely to be much nearer the truth. Mun, being, as we have seen, a foreign merchant of the highest eminence before 1609, can hardly have been born later than 1600, and most probably was dead long before 1660. His 'England's Treasure,' is addressed to his son, and begins: — My son, in a former discourse, I have endeavoured, after my manner, briefly to teach thee two things: the first is piety; the second is policy; so and now I am to speak. But whether this former discourse was even published we do not know. Mun, however, has always been understood to be the writer of a work entitled 'A Discourse of Trade from England to the East Indies, by T. M.' 4to. London, 1621.

The object of this last-mentioned work is to defend the East India trade from the charge brought against it of exhausting the national wealth by occasioning an annual exportation of treasure, or of gold and silver, or for a moment doubt, that the true profit of the country upon any branch of commerce is to be measured by the balance of money which it annually brings into the country; but he was, however, justly observed by himself, would upon this principle be a losing trade, yet it became in reality profitable in consequence of the exportation of certain commodities which it enabled us to make on other East India. Every year we are sending back every year a much larger amount of treasure than we sent out to India. The reasoning is the same that was afterwards employed by Sir Josiah Child in his anonymous pamphlet, 'The East India Trade, a most profitable Trade to this Kingdom,' published in 1677. The same doctrine is also expounded in Mun's other work, his 'England's Treasure by Foreign Trade,' the fourth chapter of which, principally relating to the East India trade, is headed, 'The exportation of our monies in trade of merchandize is a means to increase our treasure.' The fundamental principle of that work is stated in the second chapter:—'The ordinary means to increase our Treasure is by the exportation of such articles as the English merchant, or every man who engages in foreign commerce yearly expressing merely the writer's agreement or dissent.

MUNDAY, ANTHONY, must, according to his epitaph, have been born in 1656. His early life is almost totally unknown; but he was at one time abroad, and describes himself
had to ana point mere be

The Ajaccio, Cork uses
her by the

Execution of certain Traytours at Tizborne the 26th and 30th days of May, 1592; gathered by A. M., who was there present.

"He had, it appears, held a dispute at the foot of the gullows with many frequenters of plays, and also of pageants for the corporation and companies of London. Ben Jonson, in 'The Case is Altered,' written early in 1659, ridicules him and his city-shows, in his character of Anthony Baldinino, making this personage to say of himself, that he supplies the place of pageant-poet to the city of Milan when a worse cannot be had, and that he uses as much state stuffs as any man does. Perhaps Ben's critical acumen was a little sharpened by the fact that Monday had just been called our 'best player,' during the 'Mere's' Palladin Tamie, in which Jonson's own name is not mentioned. Mr. Collier enumerates fourteen plays which Munday wrote or assisted in writing, desiring however to add to this heroic list the plays of 'The Puritain, or the Mere,' 'The Earl of Robert Earl of Huntingdon,' by Anthony Munday and Sir Charles Hackett, both acted in February, 1598, and printed in 1601. Both are reprinted in Collier's 'Supplementary Volume to Doddson's Repertory.' The performance of these pieces, possessing much vigour of painting, and presenting, in the scenes with Robin Hood's band in Sherwood Forest, some pleasing poetry. 3. 'The Widow's Charm,' acted in July, 1603, was dedicated to the memory of 'The Poet,' or 'The Widow of Waffling Street,' which was printed in 1607, and has been absolutely ascribed to Shakespeare. 4. 'The First Part of the Life of Sir John Oldcastle,' by Anthony Munday, Michael Drayton, Robert Wilson, and Richard Hattery; published twice in 1600, one of the editions attributing it to Shakespeare. Munday died on the 10th of August, 1633, and was buried in the church of St. Stephen, Coleman-street.

MURAT. CAROLINA MARIA ANNUNZIATA BONAPARTE, sister of Napoleon, born at Ajaccio, in 1782, married in 1802 General Murat, then aide-de-camp to the First Consul, and became Princess of Berg, and afterwards Queen of Spain in 1808. She was the only daughter of Napoleon who became a queen. She took a considerable part in the public affairs of the kingdom of Naples, and was several times regent in the absence of her husband, who was compelled 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 the part of a conciliator between her spirited and 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. She died on the 16th of November, 1855. 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 Monte Carlo, where she afterwards lived in poverty. Madame Murat had a very favourable opinion of his sister Caroline.

(Lettre, Anniv.)

MURÉNA, an apodous malacocephalous fish of the family Anguillidae, Bowd., 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 scaled, with the exception of five lateral rows of small tubular fins. The orifrices of the gills are small and open, one on each side. In each jaw there is a single row of teeth. The dorsal and anal fins are very low, and are united. The Muréna Heliosa is the type of the genus. It is found in the P. S. C., N. 155.
with his Euclid and algebra. Mr. Brown, who was then employed in a parish in which Mr. M. C. was, a Cambridge Master of Arts, was the proprietor. This last-named gentleman, being then about to visit England, promised to take some of Murphy's papers with him, and to do what he could to bring them to the notice of Professor Wollaston, who had made various contributions to the Mathematical and Physical Repository. 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 remain, to meet the case of his possibly being able to look at 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 he had continued to fix his attention on it. He had not at first found his genius unacquainted with any amount of genius and industry, unaccompanied by strict attention to the University course of reading: and Mr. Murphy's time, though occupied by speculation, came out third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. 

Mr. Murphy began his residence at Calais 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 his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. Mr. Murphy's time, though occupied by speculation, came out third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanyed by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanied by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanyed by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompained by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanyed by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of genius and industry, unaccompanyed by strict attention to the University course of reading. In 1829 he took his bachelor of arts degree, and at once entered third wrangler. The highest place is sometimes not to be gained by any amount of
to a high standard in point of clearness of exposition, and are besides based on a wrong principle, that of teaching the pupil how to write good English by placing before him specimens of it. His Specimens of English are, consequently, very obscure, and rules are laid down without explanation of the principles on which they are founded, and if the pupil commits the definitions and rules to memory, believes in them, and can apply them, his grammatical education, as far as these works are concerned, is considered to be complete. But grammars of this class still supply the wants of the present age, even for the purposes of common school instruction, and ought to be superintended by a better kind, in which the principles of the language should be explained, as well as illustrated by specimens selected from the best writers. Murray's Grammar is altogether deficient in the etymological part, and his dissertation on the sounds, his grammar of words, and his grammar of their kindred, show a lack of knowledge of the true forms of words and their historical deduction from the early state of our language. His next publication was a series of extracts called 'The English Reader,' to which he soon afterwards added an 'Introduction,' and a 'Sequel,' the three volumes containing respectively selections suited to pupils of different degrees of maturity. The success which attended these publications induced him to publish the 'Lecteur François,' in 1792, and in 1797 an 'Introduction to the Lecteur François,' which he published a Spelling-Book. For the copyright of all these works he received a liberal price, and as he had no children, and his property was as much as he and his wife required, the income from them, with the interest of other editions that were issued, was about £15,000. In 1806 he published an enlarged edition of the Grammar and Exercises, in 2 vols., designed for the use of persons who might desire it worthy a reference to the 'History of English Grammar,' the 'Lecteur François,' the 'Homme's Commentary on the Psalms,' 12mo., and a little work, published in 1817, 'On the Duty and Benefit of a frequent and serious Perusal of the Holy Scriptures.'

Murray's thorough knowledge of his business for so many years to bodily infirmity as well as to some severe attacks of disease, continued to live till his eighty-first year. He died Feb. 16, 1826, with the reputation of being an exceedingly kind and accomplished man. (Memoirs of the Life and Writings of Lindley Murray, in a Series of Letters written by himself; with a Preface and Continuation of the Memoirs, by Elizabeth Frank, York, 1826.)

MURRAY, JOHN, publisher, born November 27, 1778, died June 27, 1843. His father, originally an officer of Marines, whose name was MacMurray, purchased (1768) the business of Paul Sandby, 32, Fleet Street. John Murray was educated at several schools—at the High School of Edinburgh, at Kensington, at Dr. Burney's at Gosport, where he lost the sight of an eye by the accident of the writer's talents being suggested by his uncle, James Murray of Loughborough House, Kensington. At the age of fifteen he lost his father, a great misfortune, as it left him without control and direction; his mother married again, and his education was in considerable measure conducted by a medical bookseller, in partnership with Mr. Hightley, having dissolved the partnership in 1803, he soon devoted his attention to a wider field of literary business. The son of an old friend and neighbour, Dr. Rennell, Master of the Temple, Mr. Stradford 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 the 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 countering the political influence of the 'Edinburgh.' While maturing his project—the most important undertaking of his life—it chanced that a severe criticism on Scott's 'Marmion' appeared, which was not made evident in the 'Edinburgh Review.' Mr. Murray instantly started for Scotland, was introduced to Scott at Ashiestiel, in September, 1808, found in him a warm supporter of his intended review, and through the aid of Mr. Scott and the influence of his friends, Hebers, George Ellis, Canning, Barrow, and Mr. Gifford, the editor, the publication commenced in 1809, and soon attained a circulation of 12,000 copies.

The most alliance of business and friendship long subsisted between Mr. Murray, and Constable of Edinburgh, and the Ballantynes; but he early perceived the result of its hankering after a cheap model of 'Waverley,' forego ing 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 'The Last Hero of Scotland,' besides 'Waverley,' nor did he ever entertain any doubts on the subject. In 1810 he was sought and made the acquaintance of Lord Byron, giving 600l. for the two first cantos of 'Childe 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 congenial characters. In the afternoon might be found in his drawing room, Scott, Byron, Campbell, Wm. Spencer, R. Heber, Gifford, D'Israeli, Mr. Ward (Lord Dudley), Canning, Hallam, Croker, Barrow, Madame de Stael, 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 that close 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 1000l. for 'Childe Harold,' which he received on 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, and, in 1824, he printed '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 Mungo Park, Belzoni, Parry, Franklin, Donham, and Clapperton—the Family Library, begun April, 1826—the Domestic Cookery, of nearly 300,000 copies has been sold, the fortunate title having been secured in a dispute with the original publisher, for the 'Family Cookery Book'—and 'Deathbed Scenes.' The three last works, originally published by others, proved failures until Mr. Murray, perceiving their merits, took them into his own hands.

Bounded to the liberal-minded man of business and a gentleman, will be found in the Lives of Byron, Scott, and Crabbe, and especially in his modest 'Answer to the Calumnies of Captain Medwin,' appended to Byron's works.

The 'Quarterly Review,' the object of his pride and solicitude, was conducted from 1809 to 1825 by Mr. Gifford, since which, with the exception of one year (March to December, 1825), during which Mr. (now Justice) Peelridge was editor, it has been directed by Mr. Lockhart. Although the principles on which it was established and conducted, excluded the publisher from any interference in its management, yet his tact and perseverance in carrying out the objects in suggestion subjects for review, and in enlisting contributors, tended much to its popularity. He was an excellent man of business; and, when he really applied, could get through more work than most men. No one better understood how to measure the calibre of an author's genius, or the extent of his popularity, and few could be more skilful in timing a publication, so as to secure its favourable reception. His eminent merit—that which distinguishes him above the majority of his class—was that he dealt with the commercial department of literature in a spirit far above that of the mere dealer and chapman. Had he thrown away his capital and his talent, and given himself to the idle occupation of a publisher—a design which some think the especial duty of every publisher—a few years would have conducted him to ruin. But he did better than this. He indirectly encouraged all literary
effort by dealing honourably and generously with authors whose reputation was established, or of whose success there could be no doubt. This was not patronage, but equitable distribution of the revenue of the capital and the benefactors. 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 imprint alone gave a recommendation to a hook without it. Above all, he increased the security of advertising quacks. 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 a precarious state for some months preceding it, no warning was given of his death for three days before it occurred. Mr. Murray married in 1807 the daughter of Charles Elliot, bookseller, of Edinburgh, by whom he left one son, who continues his business, and three daughters.

MUSCA, a genus founded by Linnaeus in 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 typical family Muscidae no fewer than 1700 European species have been described by Melgen, and nearly as many more extra-European have been described by Rohnouin Desvoidy in a quarto volume of 512 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 larva when hatched are found on stores of provisions there collected. The larva of Tachina are parasitic on other larvae. The adults of some other genera are found only in the dead bodies of particular species of animals, as Osmynota, which reside in the caskets of the dead. The blue-bottles and blow-flies, species of Lucilla and Calliphora, which continue by fly-blown. Anthomyia deposits its eggs in manure or in the roots of vegetables, and Tephritis in growing plants. The choose-maggot is the larva of an insect of this family named Psophila imbricata. Drosophila seallia deposits its eggs in fermented liquors.

Most of these flies are extremely prolific; the ovaries of the female flesh-fly (Sarcophaga carnaria) have been found to be arranged in spiral fashion and to contain as many as 20,000 eggs.

(Weastwood, Introduction to the modern Classification of Insects, and the writings of Melgen, Halloween, Desvoidy, and Maccurt.)

MUSCA/RI, a genus of plants belonging to the natural order Liliaceae. It has a globous or subhydridam perianth narrowed at the mouth and 6-toothed. The stamens are inserted at about the middle of the tube, the filaments not decurrent.

M. racemosa, Grape Hyacinth, is the only British species of this genus. There is also a species in Suffolk near Fakenham, 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, flaccid, and recurved. The flowers are on a short stalk. It grows most abundantly in sandy fields.

The bulbs of M. muschatus are, according to Lindley, emetic.

(Babington, Manual of British Botany; Lindley, Vegetable Kingdom.)

MUSCOVADO SUGAR. [Sugarc. F. C. P.]

MUSCULAR TISSUE. [Tissues, Animal, F. C. P.]

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 materials illustrative of the application of geology to the useful purposes of life, and of the material wealth of the kingdom. The advantages which would arise from such a collection, and its exhibition to the public, under the care of the Royal Institution, had been grasped by the gentleman and the ladies of the public, between the hours of ten and four in the morning, and ten and five in the evening. The principal officers to the establishment are Sir H. T. De la Beche, already named as the Director, Mr. Richard Phillips, Curator, and Dr. Lyon 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 metals are extracted; these being arranged with reference to the times when they 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-stones, procured by the commissioners appointed in 1838, to visit the quarries and examine the quarries of the stone to be used in the New House of Parliament. These specimens, with the very 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 formed into vases.

Another object intended to be effected by the formation of the Museum is the promotion of improvements in agriculture, by exhibiting sections of strata, with specimens of soil, and the rocks from which they have been derived, or disintegrated, or in which they have been produced. It is intended, by this department of the Museum more especially, to exhibit the relations of geology to agriculture by imparting such a knowledge of the mineral strata as may suggest the means of permanent improvement on the surface. As constituting a large and most important proportion of the mineral riches of the empire, the Director has been especially careful in collecting specimens of these strata from every part of the 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 constructions, a service of much importance, especially in the mineral districts.

The Museum contains an extensive collection of the various metallic ores of Great Britain, with specimens of the results of the metallic processes by which they are raised; those of copper, zinc, lead, and silver, 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 this the analysis of soils and minerals is performed for the public on very moderate terms, and pupils are admitted into the laboratory for instruction in analytical and metallurgic chemistry.

In the Mining Record department are deposited plans and sketches of mines and quarries, the works and sections, and the modes of the machinery by which they are worked; it also contains works and sections in which many of the models have been constructed; and collections of mining tools used in several of the different countries are also exhibited. The department having of course the objects by 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 larger and more commodious house for the purpose, which will extend from Piccadilly through to Jermyn-street.

MUSHROOM. [Agaricus, F. C. P.]

MUSCO'RA, a genus of species, by Linnaeus, and Musco'ra, P. C.]

MUSCO/RA/PUM, a genus of fossil plants, the fruits only known. From the coal measures of Lancashire. (Brownrigg.)

MUSOWA, or MUSOWA. [Astrabia, P. C. S., p. 24.]

MUTILLIDE, a family of Hymenopterous insects corresponding to the Linnaean genus Mutilla. These bees belong to Lattreil. Some of the species are remarkable for the power of their sting. MUSI'ANO, GIRO'ALMO, an eminent Italian painter, was born at Acquasfonda near Brescia, in 1528. He was first instructed by G. Romantini 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 "landscape-Christ." In 1573 Raffael painted his famous landscape Jomone. 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 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 Mary, which he painted for the church of Santa Maria Maggiore. This picture was afterwards removed to the Appartamento de Principi in the Quirinale, or papal palace of Monte Cavallo, where it stood for a hundred years, but it was not seen there by Ramboud 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. Valtell for the "Cabinet de Cronart," in 1729, as part of the Orleans collection, it cannot be the picture so much approved of by Michelangelo, unless the account of Titi is incorrect. When the part of the Orleans collection, of which it was one, was sold by auction in London in 1800, it fetched only fifty guineas: who the purchaser was, or where it is now, is not publicly known.

There are many of Muziano's works in the churches and galleries in Italy, and many in other countries. One of his works is in the churches of Sant' Ignazio in Rome, St. Peter's, in the cathedral of Arezzo, and the church of Santa Maria del Popolo; some of these pictures are executed in a style similar to that of the earlier works of Raphael. Muziano's paintings may be divided into two classes: one, historical or religious subjects; the other, small pictures of flowers and landscapes. The former are inferior to the latter, being executed in a more naturalistic style, while the latter are true masterpieces of landscape painting. Muziano's landscapes are characterized by their rich color and the delicate handling of the trees and foliage. His landscapes are often compared to those of Claude Lorrain, but Muziano's works are more delicate and refined.

The following are the remaining British species of this genus:

M. repensa, Mouse Ear, with narrow lanceolate teeth; of the corolla slightly emarginate, the pubescence of the stem spreading. Found in boggy places.

M. capitostra with narrow lanceolate teeth; the limb of the corolla equaling the tube, the lobes entire, the pubescence of the stem adpressed. Found in water places.

M. aureostris has an attenuated limb of the corolla longer than the tube, the root-leaves on long stalks pointed. Only found in Scotland on the summits of the Breadalbane mountains.

M. agrestis has calyx rounded below, deeply 5-cleft, closed when in fruit; the limb of the corolla longer than the tube, flat; the root-leaves bluish. Found in shady places.

M. arvensis, Field Scorpion-Grass, has the calyx half 5-cleft; the limb of the corolla longer than the tube, convolute. Grows in cultivated land and thickets.

M. collina has the calyx open and ventricose when in fruit. Found on dry bank.
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**MYR**

_**M. persicolar**_ has the calyx closed and oblong when in fruit. It has small flowers, at first pale yellow, afterwards blue. Found in meadows and on banks.

_M. aerifera_, generally found in medicine or the arts. The British species are most desirable for cultivation, especially

_M. polystria_ and _repsus_. 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 seed may be sown. The other species may be propagated by dividing the roots.

(London, Manual of British Botany; Don, Gardner's Dictionary.)

**MYRIACANTHUS**

M. _Agersis_, a genus of fishes and fish-like animals, found in the lower silurián strata of Lampeter, in South Wales. (Murchison.)

**MYRICA** (the Greek _myrchos_), a genus of plants the type of the natural order Myricaceae. It has its flowers in catkins, which are composed of cone-like scales; 4 to 8 stamens. The fruit is 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 shrubby stem. It is a bushy plant, and the flowers are white or pink. The flowers are pink or white, 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 by a yellow atheral oil, of a feeble odor, and mild taste, which after a little time becomes slightly warm. The leaves were formerly used as a remedy against the itch, and when bruised are used amongst furs for the destruction of the moth. In decomposition they are employed for the destruction of bugs and other vermin. In Sweden they are used as a substitute for hops in brewing.

_M. cerifera_. Wax-myrtle or Bay-tree, has ciliate 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 cone 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 staminate ones, and consist of narrow scales, with each an ovate ovary, and two fimbriate styles. To these catkins succeed clusters or aggregations of small globular fruits, which are at first green, but then change to a bright red. The small flowers are surrounded by a yellow atheral oil, 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 surrounds the fruit from the mature state. 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 bees-wax.

The fruit of _M. sapida_, a native of Nepal, is about the size of a cherry, and is pleasantly acid and estable. (Lindley, Flora Medica; Lindley, Vegetable Kingdom; Babington, Manual of British Botany.)

**MYRIOPHYLLETES**, a genus of fossil plants, from the coal measures. (Arctis.)

**MYRIOPHYLLUM** (from _mueros_, numerous, and _phyllon_, a leaf), a genus of plants belonging to the natural order Haloragaceae. It has monoeccious flowers; a 4-pated calyx; 4 petals fugitive, longer than the calyx in the staminiferous flowers, small and reflex, or none in the pistilliferous flowers; a 2 or 4-ovuliferous pistil, or 2 or 4 ovulae, in the fruit tetracentric, 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 racemes, and in whorled spikes, the upper leaves being almost entire.

_M. verticillatum_, verticillate water milfoil, has the flowers all axillary whorled, the bracts pinnaflid. 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 spike, the bracts pinnaflid, the 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. aquatica_, water milfoil, has the spike 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. There are some that are 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 the spring from a native pond, planted in a grove of water 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 mean time, where they will thrive much better than if grown all the year round in pans of water or cisterns in a hot-house.

(Own, Gardner's Dictionary; Babington, Manual of British Flora.)

**MYRIPRSTIS**, a genus established by Cuvier for certain tropical fishes of the family of Percides.

**MYRMELEON**, a genus of large neuropterous insects, the larvae of which are aquatic, and are said to catch 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 'Academy' for 1825. (Don, Gardner's Dictionary.)

'Some larvae of the common species, _Myrmle- leon formicolus_,' writes that naturalist, 'which I brought alive to this country from France, afforded me ample opportunities for watching their proceedings. It is in fine sand and the larvæ make its pitfalls. When placed upon the surface, it bends down the extremity of the body, and then pushing or rather dragging itself backwards by the assistance of its hind legs, but more particularly of the de- flexed extremity of its body, it gradually insinuates itself into and beneath the sand, constantly throwing off the particles which fall upon, or which it throws with its jaws or legs upon its head, by suddenly jerking them backwards.'

_Discobolus._

**Proceeding 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 ex- tended being the only parts that appear above the surface; with these it hews a hole in the sand to fall down to 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 means escape, the ant-lion 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 larvæ feed. They are however capable of undergoing long fasts, for one of my larvæ re- mained from October till March without food. Previous to assuming the pupa state, the larva forms a globular co- coon of less than half an inch in diameter of fine sand, glued with silken threads spun from a slender telescopic-like spinneret, placed at the extremity of its body, and lined with fine silk. The cocoons are small, not being laden at all, and in- inactive, and with all the limbs laid at rest upon the breast. When ready to assume the perfect state, it uses its own mandi- bles, which are quite unlike those of the larva and image, to gnaw a hole through the cocoon, and thus itself partly through the aperture in which it leaves the pupa skin. Immediately upon assuming the perfect state, the abdomen is almost immediately extended to nearly three times its previous length. (See also the writings of Rösel, Reaumur, and Bonnet and Guilding.)

**MYRON**, one of the most celebrated gods of ancient Greece, a nephew of the Divine Poseidon, of which that among the Townley Marbles in the British Mu- seum is supposed to be an antient marble copy, was born at Eleutheria in Boeotia about 480 B.C. Myron was the fellow-
pupil of Polycleitus under Ageladas; 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.

For the following account of this work, he first obtained a reputation by a bronze 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 made also a dog: a quoit-thrower; Perseus, in Werner Medicus, and, as Böttiger explains priaxis, sea-monsters; also a satyr admiring a flute; Minerva; Delphic pentathlete; pancreustas; a Hereules which was in the temple of Pompeius in the Circus Maximus; and also a statue of Apollo which Myron, after Antoninus brought from Ephesus, and Augustus restored to the Ephesians, being warned to do 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 (Satyricon, c. 88), gave the souls of men and animals to brass. He was, says Pliny, more numerous and various than Polycleitus, 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 teneus curiosis, animal sensum non expressisse,' is a characteristic disputed at some length. In the ville de Bucchessi the villa 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 type, as rendered splendidly by Phidias, for he has a round form, and a formal manner of the earlier artists, which he much more probably did by taste than from any want of perception, as Pliny seems to imply.

From an observation of Pliny’s, Winckelmann placed Myron back to the time of Anacreon and Erinnia: Pliny supposed that an epigram of Erinnia spoke of a monument to a grasshopper and a boar by Myron; this epigram is in the Greek Anthology, and, as Pliny asserts, was surpassed by the One nor Myron, there spoken of, says Silius, its virgin whose charms were sometimes fatal to her rivals. Myron executed many works besides those mentioned by Pliny, though some of them were destroyed by fire. It is recorded that in the temple of the portico of the temple of Apollo on the Palantine 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 name of Myron, was on the thigh in silver letters, was plundered from Verres from the temple of Eseulaps at Agrigentum, where it had been consecrated by Publius Seio: Pausanias mentions the Perseus killing Medusa. A great work by Myron was a group in the shape of the quoit. At Sto. Stefano a winged victor among the buculae, 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 to their place again by Augustus; the Jupiter of Bethune place was a statue of Jupiter, which Pausanias, who says, after his Erechtheus, was Myron’s best work at Athens. The Athletes by Myron must have been very numerous, as he was particularly distinguished for works of the kind. He is mentioned several times in Pausanias and other ancient authors; as Sallus, a celebrated Lacedemonian runner; two of Lycius, a Lacedemonian charioteer, at Olympia; Tunnanthes of Cleone, a pancentaist; Philipius of Tallene, a juvenile pupil; and one supposed to be Chionis of Lacedaemon, also an Olympic victor, but denied by Pausanias to be Chionis (vi. 13).

All the above works were executed in bronze of Delos; Polycleitus used the Eginina 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 woman, by Smyrna, by Myron; and Pausanias describes by him a single-bodied Erestes with one head, in wood, which he saw on the island of Eginina: she was the chief divinity of the Eginetans according to Pausanias (ii. 30).

The most celebrated of all Myron’s works was his Cow, lowing, and according to some cackling a calf; there are not less than thirty-six epigrams on this work in the Greek Anthology.

No human figure has attracted so much notice, and doubtless more of the admiration this work excited was owing to the position of its setting up on the Acropolis of Athens than to the beauty of the figure itself. The most celebrated of the horse’s heads which Myron produced were certainly rare, and this Cow may have been the first good work of its class that was set up at Athens: the horses of Phidias were more beast-rilievi placed under a colonnade, and, having the heads of an empress, showed the little effect compared with an isolated bronze, perhaps gilded, figure of the natural size, and fixed upon a marble pedestal in

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 Procopius it was in the temple of Peace at Rome. Ausonius wrote the following beautiful description of this work:

Buncha sum, omne grattarum facta Myronis

Succusatque me profana, sed gentium,

Sic viribus et viris profana nomina mortis:

Nec virilis eterna sine mora petit.

Myron’s head he supposes to have been made by

Inter pennis me numerum solit.

(Recipe 5.)

The same idea is still more happily expressed in an old Greek epigram, incorrectly attributed to Anacreon; the following English version of it is from an old translation of Anacreon printed by Dibdin, and is attributed to Fawkes:—

This heifer is not, but swelling years

Hardened the life to what it now appears;

Myron unjustly that honor claim’d.

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 ancient art: the original was in bronze, but there are still several antient 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 in the villa of the Massimi in Rome, and was acquired from them 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 since been observed, are supposed to be as perfect and as near to the original as the imitations of this work of Myron. The Townley copy according to some critics has been incorrectly restored, and the hand is said not to belong to it. In Lucian’s description of the Discobolus of Myron the head is noticed as being thin 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 copies from the celebrated Myron. The Discobolus, as it leaves us, is a work of great beauty.

The squat or thigh-throw being turned to the front, or the slow throw—this is the sort of figure, which Phæo interprets by the figure in which he receives it, and which Pliny calls the brewer or the ‘girl or boy who holds the quoit:’ implying that the thrower was not yet in action, having only assumed his position, turned his head back, and extended his hand to receive the quoit from the other hand; the quoit is thrown to him by the attitude of the Discobolus, not expressed. The Townley marble is however throwing the quoit, both knees are bent, and the toes of the left foot, on which the figure partly rests, are put forward, while the right foot is placed either at an angle of forty-five degrees, or nearer to the horse’s head, and the Townley marble 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 not unwisely 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 of impetus is produced by the head shooting upwards and forward, along with the other extremities.’

Myron had a son Lykos who was likewise a sculptor. He is men­tioned by Pliny, and Pausanias (i. 28) says he saw in the Acropolis at Athens a bronze boy holding a laver, by Lykos, the son of Myron. The Attic Medusa, instead of Averô in this passage): Pliny calls Lykos the pupil of Myron.

[Pliny, N. H. 36. 19; 36. 5; 41. 1; Catullus, Cat. 143; 145. 1; 147. 1; 148. 1; 150. 1; Seneca, Epist. 101, 119; Winckelmann, Werke, vol. i.; Böttiger, Allgemeine Urheber-
MYR, a genus of plants belonging to the natural order Umbelliferae, and to the tribe Umbellifae. It has an ample calyx; obcordate petals, with an infixed point; the fruit not beaked; the carpel covered with a double membrane, the outer membrane with elevated keeled ridges hollow within, the inner one close to the seed, no vitre. The species have leaves three times decomposed, the leaflets pinnatifid; the involucre wanting; the involucels of many lanceolate ciliated leaves, the central flowers of the umbel staminifereous; the petals white.

M. odorata, Sweet Cistley, or Great Chervil, has the leaves downy beneath, the leaflets of the partial involucres lanceolate acuminate. This plant has a stem 3 or 2 feet high, round, leafy, and hollow. It is a 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 used in salads, the roots 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. M. officinalis is the species, and it 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 communis, Common Myrtle, has solitary 1-flowered pedicels about the length of the leaves, bearing 2 linear bracteoles under the flowers; the calyx 5-lobed; the leaves ovate, lanceolate, or linear. This beautiful plant is a native of the south of Europe; it is found wild in France about Mar-
sellès, and extends from that city along the sea-coast to Genoa, and throughout Italy. In these districts it forms thickets, and rarely grows without the spray of the sea. This plant has been in all ages a great favourite in Europe. It was called by the Greeks μύρος. Μυρίγιον is the name under which Hippocrates refers to this plant (Horm, Med, i, 560). Theophrastus also uses this word and μυρίγιον 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 Myro in Italian and Spanish; Myrte in German; Myrte in Danish; Myrtens in Swedish; Mirté in French; Mürta in Portuguese.

The leaves of the myrtle, like the whole plant, contain a volatile oil which possesses medicinal properties, and that was used as stimulants by the ancients. The buds and berries of this plant also contain volatile oil, and were used by the ancients as a spice, and are at this day, in Tuscany, employed as a substitute for pepper. The Tuscans also prepare a kind of wine from the myrtle called myrtidum. The berries are used at the present day in Greece as a remedy in the diarrhoea of little children. The mode of adapting them is unknown; they may be cast of the myrtle have an agreeable scent, and when distilled they form the perfume sold in France under the name of 'Eau d’Ange.' In addition to a volatile oil the myrtle contains a quantity of a wine which on some is astrigent 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 Corham Hall, in Kent, there are several specimens 50 feet high. In the Isle of Wight it forms the hedges of many gardens, but however be be not to that, many have been 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. alenocarpa (D. C. Prod. iii. p. 239), fruit blackish. This variety of myrtle is frequent in the south of the west, and in gardens, where there are varieties of it with double flowers and various other improvement, often 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.

Var. a. Romana (Mill. p. t. 184, p. 1), leaves ovate; pedicels longer. 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. c. Italica (Mill. Dict.), leaves ovate-lanceolate, acuminate. The orange-leaved myrtle.

Var. d. Etruscica (Mill. Dict.), leaves lanceolate, acuminate. The broad-leaved Dutch myrtle. Leaves crowded, dark green. The double flowering myrtle appears to be of this variety.

Var. e. Bellica (Mill. Dict.), leaves lanceolate, acuminate. The broad-leaved Dutch myrtle. Leaves crowded, dark green. The double flowering myrtle appears to be of this variety.

Var. f. mononthera (Lin. Dict.), leaves linear, lanceolate, acuminate. M. minima (Mill.), rosemary or thyme-leaved myrtle.

M. monantha (D. C. Prod. iii. p. 239). Fruit white. 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 hold in esteem among the Jews in their religious ceremonies.
4. Silver-striped Italian myrtle.
5. Striped box-leaved myrtle.
7. Var. a. etaminiferous. This myrtle appears to be only a variety of this.
8. Cockscough, or bird's nest myrtle.

About forty other species of myrtle besides those of the old genus Myrtus now referred to the genera Myrica, Symphytum, 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. tomontea is a native of Cochinchina. It is a handsome shrub, and has been found to grow well against walls in the south of England.

M. nummularia is a creeping species found at the Straits of Magellan, and M. nummularia, 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 sandy loam and peat; and cuttings readily strike in sand or peat. (Don, Gardener's Dictionary; London, Arborum Brit. ; Friaa, Synopsis Flora Classicca, in; Burnett, Outlines of Botany: Lindley, Flora Medic.)
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, entrusted 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
Fontus. Mytens returned to the Hague, and was still living
there in 1656, 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 enter-
tainment 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 Dunmore. Sir Jeffrey died a pris-
soner in the Gate-house, Westminster, in 1692, aged sixty-
three: he was imprisoned upon suspicion of being concerned
in the Popish Plot.

A more celebrated painter of the period was Hollar, who
was a pupil of Mortier, an artist of considerable note who
lived in the reign of Charles II. He was a man of great
ability, and is said to have been the inventor of the process
of engraving upon copper plates, which was afterwards
perfected by Merian. Hollar was also a great etcher, and
his works are still highly esteemed for their beauty and
accuracy. He is especially noted for his prints of the
ruins of ancient buildings, and of the natural history of
the birds and beasts of the country. His drawings are
also very fine, and are much prized by collectors.

The other great artist of the period was Willem van de
Veldt, who was born in about 1610, and died in 1691. He
was a pupil of Rembrandt, and was celebrated for his
Portraits, landscapes, and historical paintings. He was
also a great etcher, and his engravings are very fine and
beautiful. He is especially noted for his portraits of
the great men of his time, and his works are much prized
by collectors.

The following are some of the artists who were
active in the period:

1. Pierre Martens (1623-1699), a painter and
etcher, who was born in Brussels and died in
London. He was a pupil of Rembrandt, and
was celebrated for his landscapes and portra-
ts. His works are still highly esteemed for
their beauty and accuracy.

2. Willem van de Velde the Elder (1633-1707), a
painter and etcher, who was born in
Amsterdam and died in London. He was
celebrated for his seascapes and marines,
and his works are still highly esteemed
for their beauty and accuracy.

3. Jacob van Ruisdael (1628-1682), a painter
and etcher, who was born in Amsterdam
and died in Amsterdam. He was celebrated
for his landscapes and seascapes, and
his works are still highly esteemed
for their beauty and accuracy.

4. Jan Steen (1626-1679), a painter and
etcher, who was born in Dordrecht and
died in Dordrecht. He was celebrated
for his peasant scenes and still-lives,
and his works are still highly esteemed
for their beauty and accuracy.

5. Gerrit Dou (1613-1675), a painter and
etcher, who was born in Amsterdam and
died in Amsterdam. He was celebrated
for his still-lives and intimate scenes,
and his works are still highly esteemed
for their beauty and accuracy.

6. Aelbert Cuyp (1620-1691), a painter and
etcher, who was born in Dordrecht and
died in Dordrecht. He was celebrated
for his seascapes and marines, and
his works are still highly esteemed
for their beauty and accuracy.

7. Gerard van Honthorst (1590-1656), a
painter and etcher, who was born in
the Netherlands and died in Florence.
He was celebrated for his portraits and
portraiture, and his works are still highly
esteemed for their beauty and accuracy.

The following are some of the artists who were
active in the period:

1. George Vertue (1684-1756), a painter and
etcher, who was born in London and
lived in London. He was a pupil of
Watteau, and was celebrated for his
Portraits and landscapes, and his
works are still highly esteemed
for their beauty and accuracy.

2. John Sellars (1695-1766), a painter and
etcher, who was born in London and
lived in London. He was a pupil of
Watteau, and was celebrated for his
Portraits and landscapes, and his
works are still highly esteemed
for their beauty and accuracy.

3. John Coney (1695-1751), a painter and
etcher, who was born in London and
lived in London. He was a pupil of
Watteau, and was celebrated for his
Portraits and landscapes, and his
works are still highly esteemed
for their beauty and accuracy.

4. John Lewis (1695-1751), a painter and
etcher, who was born in London and
lived in London. He was a pupil of
Watteau, and was celebrated for his
Portraits and landscapes, and his
works are still highly esteemed
for their beauty and accuracy.

5. John Raphael (1695-1751), a painter and
etcher, who was born in London and
lived in London. He was a pupil of
Watteau, and was celebrated for his
Portraits and landscapes, and his
works are still highly esteemed
for their beauty and accuracy.

6. John Smibert (1687-1751), a painter and
etcher, who was born in London and
lived in London. He was a pupil of
Watteau, and was celebrated for his
Portraits and landscapes, and his
works are still highly esteemed
for their beauty and accuracy.

7. John Board (1695-1751), a painter and
etcher, who was born in London and
lived in London. He was a pupil of
Watteau, and was celebrated for his
Portraits and landscapes, and his
works are still highly esteemed
for their beauty and accuracy.
NAGPOOR, a district formerly included in the province of Berar, in Hindustan, but now in the adjoining province of Gandwa, of which the city of Nagpoor is the capital.

Ellipsoor is the capital of Berar. The palace and seat of government of the British is at Nagpoor, and hence it has as frequently styled the raja of Nagpoor as the raja 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 the events of the state, and they have a political agent resident at Nagpoor. The British government is bound by treaty to protect the raja of Nagpoor, and he is bound to pay to the British an annual subsidy of 80,000/., 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 2,650,000, and the estimated revenue 350,000/.

The portion of Berar which lies to the west of the river Wudah is included in the territory of the Nizam of Hyderabad and the title of raja of Nagpoor is consequently now perhaps a more appropriate title than raja of Berar, a large portion of the territory of Berar having been transferred to the Nizam after the termination of the Mahrrata war

(Ellichpoor) 'The East India Gazetteer': Malcolm's Central India; Appendix to Report on East India Produce."

NAIL. The use of nails being illustrated under Joints, P.C.S., p. 121, it will be sufficient here to notice the various modes by which they are manufactured.

Until a comparatively recent period almost every kind of nail was produced by hand-labour; each nail, however minute, was separately forged from a thin rod of iron, a process which is still followed in the production of what are technically known as wrong nail; and as nails so formed possess certain advantages, for particular kinds of work, over those formed either by casting, or by cutting or stamping out of rolled sheet metal, there is no reason to anticipate the total abandonment of this process, notwithstanding the continual improvement of nail-making machinery.

The making of wrought nails, which retains, in most places, the character of a domestic manufacture, forms the employment of a peculiar class of blacksmiths called nailors, who are very frequently assisted by the female members of their families. The nailor receives his iron in the form of narrow square rods, of various sizes, according to the kind of nail to be forged from them. Putting the ends of three or four such rods into the forge, at one, the nailor commences his work by hammering down the rod, which is now forged, on its end upon a small but very firmly bedded steel anvil to a tapering point. The pointed end is then cut off to the proper length, which is adjusted by a gauge, by laying it across a flat iron, and giving the blade with the head of the hammer. In some cases, as in making the kind of nail used for fixing horsehoes, this operation completes the nail; but in most cases a subsequent process is necessary to form the head.

For this purpose the red hot slab just quenched is laid on the nail-rod which is taken up and dropped, point downwards, into one of the holes of an instrument called a bore, which is a piece of iron, ten or twelve inches long, with a perforated knob of steel at each end. The holes of this instrument are made to fit the upper or thicker part of the nail, and so counterbore at their upper ends as to form a kind of mould for the head of the nail. When dropped into one of these holes, a few well-directed strokes of the hammer upon the thick projecting end of the spike or nail conveyed it into a head of any required shape. In making small nails it is sometimes practicable to forge and cut off two lengths from the nail-rod, but where this is not the case the nailor is enabled to proceed with his work without interruption by the convenient plan of having several rods in the forge, once cut, to be worked upon simultaneously. Bartow describes the manufacture of nails in his account of various processes of forging and cutting; and the whole subject is referred to his hand. In many cases, for the sake of economy, two or three nailors work at one hearth, using the same fire and the same bellows in turn; and Holland, who, in his treatise on 'The Mechanic's Encyclopedia,' vol. i. pp. 192-218, gives much curious information on the nail manufacture, describes a very simple, cheap, and convenient circular forge, patented in 1824 by Mr. Spencer, of Belper, around which five or six persons may work at the same time, and which possesses the further advantages of allowing the use of pure wood charcoal, by which the quality of the iron hosted is improved, of having no back, and of having a grating to keep them dry by the accumulation of clinkers. Though adapted also for some other purposes, this forge is especially intended for the use of nailors. The hammer used by nailors is larger or smaller, according to the size of the nails to be formed, in form, according to Hall's description, is 'the frustum of a cone, the smaller end being the base, which, instead of forming a horizontal plane, as in the case of an ordinary round hammer, is inclined or sloped considerably towards the handle. 'The degree of this obliquity, the weight of the hammer head, the size and shape of the handle,' &c., he adds, are matters of nice consideration, one nailor being rarely able to work comfortably with another man's hammer; and hence he observes, 'they are somewhat given to tramping from place to place, each workman generally carries with him a favourite hammer, which, like the famed mallet of Thor, is both the symbol and the agent of the owner's power. Of the astonishing dexterity of some of this class of operatives Holland quotes a remarkable illustration from the 'Mechanics' Magazine,' Sept. 12, 1778, in the case of the silur who undertook and accomplished the task of making, in each of two successive weeks, seventeen thousand (1200 to a thousand of 20 lbs.) of double flooring nails; in performing which task, as each nail required about twenty-five strokes of the hammer, which weighs about two pounds, he made, including the cutting up of the nail-rots into convenient lengths, and re-uniting them when they became too short, no less than 1,085,656 strokes, and moved to and from the fire at which the nails 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 cast iron, has been successfully introduced for certain descriptions of woodwork. Nails of this kind are very neat and regular in their appearance, being cast with great accuracy; and they are used to such an extent that they 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 two 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, we almost superseded those wrought by hand. According to Bartow's 'Treatise on Machinery and Manufactures,' in 'Encyclopedia Metropolitana,' the earliest machine for nail-making was contrived by Mr. French, of Wimborne, Staffordshire, in 1790, in which machine, instead of making nails by the hammer, but labour was saved by working hammer by water-power, so that women and children might perform work which would otherwise have required much muscular exertion on the part of the nailor. Bartow describes a machine 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, that of Holland, above quoted, Dr. Ure's 'Dictionary of Arts and Manufactures,' 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 state of Massa...
chamets, so long since as the year 1810 they possessed a machine which performed the cutting and heading at one stroke, with sufficient rapidity to turn out 100 nails per minute. In the process, the most commonly followed nails are cut from sheet-iron of suitable thickness, which is first reduced, by cutting transversely, into strips or ribbons, to the dimensions of the nails required. 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 blade. As the nails are required to have a tapering 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 renewed with each stroke, by the means adopted in comb-cutting machinery. [Com. F. C. S., p. 298.]

If the nails are to be of any of the kinds to which the term nail is specifically applied, as distinguished from brad, the edge 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 can 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 heading, but are completed by the action of the cutter. The action of the cutter is produced by laying together side by side, heads and points alternately, a number of cut nails or brads, when it is found that they readily come to compose a regular line. In some machines 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, in the operation of rolling, the fibers of the iron are laid longitudinally in the strip, they must lie across 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, is alluded to under JOINERY, p. 121; and another peculiarity of considerable importance is that, as such 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 biting, 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 clenching, or bending down their points with the hammer, instead of being driven completely through wood when they are 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 a nail a little strip of iron, called a brad, a small nut, and then clenching 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, or composed of silver and brass, 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 iron tacks are injurious, see TINNING, p. 482.

NAPKICHYAN. [Extrait du Biog. C. F. C. P. C.]

NANTEUIL, ROBERT, a celebrated French engraver and draftsman, was born at Rheims, in 1630, and was the pupil of his brother-in-law, N. Regemaison. 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 whole body. His engravings are very lifelike, and 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 and line, which he used to express color 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 300 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 he was a pupil in the school of the Carpentras period of his life. His master-pieces are J. B. van Steenbergen, after Duchatel, known as l'advocat de Hollande, 1688; M. de Pomponne, after Le Brun; F. M. la Mothe le Vayer, after J. R. C. de Montfaucon.

(Wattelet et Levensque, Dictionnaire des Arts, &c.; Huber, Manuel des Amateurs, &c.)

NARTOSTACHYS, a genus of plants belonging to the natural order Valerianacae. The limb of the calyx is 4-parted; the lobes ovate, oblong, acute, leafy, somewhat toothed and permanent. The corolla is regular, calcarate, obtusely 5-lobed and bearded in the throat. There are four stamens, which are similar to the pairs of the corolla, and are herbs with sweet-scented perennial roots, which are beset with erect filices at the neck.

N. satanana is a dwarf 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 obovate, lanceolate, 6-ribbed, downy; those at 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 involucre for them. It is native of Nepal, on the Himalaya mountains, and in Delhi, Bengal, and Assam, and is esteemed not only as a perfume, but as a stimulant medicine. Oriental writers give it as a remedy for tears, and for the palpitation of the heart. It seems to be really valuable in cases of epilepsy and hysteria.

N. grandiflora has a glabrous stem, oblong glabrous leaves, with solitary terminal flowers. The capsule is downy, and the lobes of the calyx evidently dentilicated. It is native of Nepal and Kumaon.

These plants should be grown in pots, in a mixture of loam, peat, and sand, and placed among other Alpine plants. They may be propagated by dividing the root, or by seeds.

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

NARTHECIA, 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 capsule pyramidal, 3-celled and 5-valved. The placenta extends only a short distance up the inner edge of the dissection. The seeds have a long filiform appendage at each end.

N. osafrutum, the only British species, has lance-shaped leaves, pedicels with one bract at the base, and another above the middle. The perianth is longer than the stamens, and considerably shorter than the capsule. The flowers are bright yellow. This species is distinguished especially by its seeds.

(Babington, Manual of British Botany.)

NASIREANS. [NAZAIRENS, P. C.]

NASIMITH, DAVID, was born in Glasgow, on the 21st of March, 1801, and in 1830 was assembling a very valuable collection of books with a view to his entering upon a course of college study at the University of that city. Finding, however, that he was averse to the study of the learned languages, this intention was abandoned, and he was early placed in a mercantile establishment. In 1818 he commenced the efforts by which he subsequently became so eminently distinguished, by taking an active part in the formation of a Youths' Bible Association at Glasgow, of which he became the secretary; and at the age of sixteen he made a public profession of religion by joining the church in Nile-Street, under the pastoral charge of the late Rev. Greville Ewing. He shortly afterwards made great exertions 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, in the establishment of adult-schools, the religious 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 the people, led to the fuller development of a character which, for distinguished devotedness, has been rarely equalled. 'The conductors of the various religious and benevolent societies in Glasgow,' observes Nasmith's biographer, 'had with a view to their objects, a large and commodious edifice, which was divided into rooms and offices, suitable to their respective objects; and 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 in the first year of the institution, at a salary of sixty pounds, though the interests of twenty-three societies thus doved upon him. In this office he was brought into frequent communication with committees composed of ministers and lay members of the Established Church, and so 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 biographer 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 his inferiors in talent and station, and who were inclined to regard his projects with prejudice and distrust. 'Even on the first interview,' observes Dr. Campbell in the 'Memoirs,' 'this article is chiefly based, no one could escape the impression that he was a man of extraordinary integrity and sagacity, piety and benevolence.'

Mr. Nasmith, observes Mr. Ashbury, '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 of the committee, the account of his deserts, wise, 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 distinct perception of the difficulty involved in leaving a province to such a character,' and in the latter part of 1828 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 still unsupplied.'

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 seemed to him most needed. He was the moral and religious welfare of that and other populous places. Young Men's Societies, or associations for promoting the religious interests of young men, for protecting them from the temptations incident to a residence in large towns, and for directing their united energies into channels of benevolent exertion, occupied them, 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, 1828, 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 1828. 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 spread of the gospel, into all the hovels and tenements of the city, 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, especial the want of a sufficient number of intelligent and zealous associations 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 so catholic a footing that, before the end of its first year, eight evangelical denominations of Christians were united in its management, and eight missionaries 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 report of the operations and results of the Christian Church, on the mission of which he impelled his success. 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 the duties of an active missionary, travelling from place to place to promote the establishment of city and town missions, young men's societies, and other kindred associations. The self-denial and moral courage with which Nasmith pursued his object, the ordinarily character, since it involved the relinquishment of any settled means of obtaining a livelihood, and of all prospect of attaining 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 benevolent mission was to a poor village, a few miles from the prosperous city mission. 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 establishment of the mission in the metropolis of Ireland, and at the same time, at the request of some friends who were opposed to its objects, he went to England, and from thence proceeded to Scotland, and in a few weeks performed the same work in Edinburgh. Having visited Ireland and Scotland, and having been in the north of England for some weeks, 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, and soon after set out for Philadelphia, which he reached in a few weeks, he found the Americans equally indebted to England and Scotland as to Scotchmen and dissenters. Here, during the three years and seven months over which the expenditure was spread, the sums received by him from friends who took an interest in his efforts amounted only to 4394. 10s. 9d., and the proportion was increased by the means of many other benevolent societies. 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 same object, he preferred to leave the decision to the conscience of each man, and who, indeed, in answer to inquiries respecting himself, would say 'I am a Christian, or I am a Catholic,' neither suffered objections or difficulties or impediments to debar him from his aim, nor to induce him to lessen his 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 aid of any churchmen. Lane, indeed, after a while, finding his fears groundless, heartily united to carry it on. Operations were commenced with only four missionaries, with salaries amounting in the whole to 207l. per annum; but so rapidly and uniformly improved was its constitution 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 7400l., exclusive of all other expenses incident to the mission. In the same year the number of domiciliary visits, and visits to hospitals, schools, and other places where the poor and ignorant are congregated together, paid by the missionaries amounted to 44,080, of which 39,469 were to the sick and dying. In a large majority of the latter class of visits the agents of the city mission were the only individuals by whom religious instruction and consolation were afforded to these poor wretched 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 the great provision has been made, by the appointment of agents suited to their peculiar necessities, for the spiritual wants of the drivers, and of the numerous Laconians, Germans, and other foreigners in the metropolis. By gaining the confidence of the people, of which Nasmith has been possessed, by the means of the city mission, the missionaries have obtained access, and often with the best results, to the haunts of misery and vice which no other agency has been able to reach. They therefore constitute a kind of moral police, of which Nasmith was the originator, 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, sec-
N A 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 5-toothed limb. The corolla is funnel-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, and the sepalas of the fruit are inappreciably reduced to the base. The seeds numerous, imbricate, winged, fixed to oblong placentae, which are adnate to the dissepiment. The embryo is invested in a fleshy albumen. The leaves are evergreen, entire, and wanting at the base of the head of flowers, but with linear pales among the flowers, which are crowded and sessile. The species are unarmed trees, rarely shrubs, and natives of India and Africa.

1. Cadamba has bracteate branches, petiolar, coriaceous, ovate leaves, triangular stipules, terminal solitary peduncles, usually shorter than the heads, which are globose. The flowers are white and coriaceous, and are protected by the involucral bracts about the size of a small apple. The style is white and exserted. The seeds not winged, the leaves from 5 to 10 inches long.

2. Kudamba is the native name of the tree; it flourishes about Calcutta and Malabar, where it grows to be a very large tree, and is ornamental and very useful from the extensive shade it affords.

3. Porphyrotheca has petiolar obvolute leaves, oval stipules, and terminal solitary peduncles; sometimes the peduncles are in tripicles, 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 is not in high estimation.

4. Cordfeolia 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 different parts of the world. Some of them are numbered and figured in the Botanical Register. They do not 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 Naucal Gamba of Hunter (Lithograph Transactions, vol. ix.) is now Uncaria Gamba. (Uncaria, P. C.)


NAUCRATES, a genus of fishes of the mackerel tribe, having fusiform bodies, tails healed at the side, and two free spines before the anal fin. The Naucrates ducers is popularly known as the Pilot Fish, and is remarkable for having a habit of following vessels often for many hundred miles. Mr. Croch, in the 14th volume of the "Linnaean Transactions," has recorded an instance of two individuals of this species which accompanied a ship from the Mediterranean to Plymouth, where they were taken by a net. The Naucrates ducers is about six inches in length, and is remarkable for the beauty of its colour, being of a silver pale blue banded by brown and deep transverse dark blue stripes.

NAUCYLIDES (Naucylides), a Greek sculptor, who was born at Argos, and was in reputation, perhaps, near Ot. 58; he was the son of Mothon and the brother and master of the celebrated sculptor, Polyclitus. He was one of the most important artists between Alcamenes and Praxiteles. Phylly mentions a Mercury, a Discobolus, and a man sacrificing a ram, by him. Paussiut notices six

N A S M I T H, a painter, born in Edinburgh, in the year 1786. He showed an early decided talent in painting, and at the age of seventeen, was an institution of art to his father. In the pursuit of his favourite art left him little opportunity of acquiring other instruction. Early in life he injured his right hand, and learned to use the pencil and brush with his left. At the age of nineteen he went to London, and his productions soon became very popular, obtaining for him the designation of the English Hobbina. It cannot be said however that he had much in common with the great Flemish master, excepting the same love of detail and elegance in his compositions. He has not the same firmness of touch as Hobbina, producing his results by an apparent multiplicity of detail. He improved in the style of his father, and his pictures have less of the spotted

Chalky character, which, from its having been followed by other members of this clever family, is characteristic of what is called the 'Naucrat School.' Notwithstanding a certain air of coarseness, Peter Nasmyth's landscapes are eminently pleasing. Though he often painted Scottish scenes, and his works are perhaps more admired in his native country than elsewhere, only a few of them were ever executed in the English. His style was not sufficiently massive property to represent the wild mountain scenery and striking atmospheric peculiarities of Scotland. Light clouds, sunshine, smooth water, or small pettering brooks, meadows, gentle rising ground, and green trees, are the objects which his style was best calculated to represent. He died in lodgings in South Lambeth, London, on the 17th of August, 1831, during a memorable period of the metropolis, when the contemplation of natural objects—strong in death—he was lifted up in his bed to behold. (The dates and incidents are taken from Memoir in Lit. Gazette, 1831.)

NASUTURTIUM. [Tropaeolum, P. C.]

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NAUCYLIDES (Naucylides), a Greek sculptor, who was born at Argos, and was in reputation, perhaps, near Ot. 58; he was the son of Mothon and the brother and master of the celebrated sculptor, Polyclitus. He was one of the most important artists between Alcamenes and Praxiteles. Phylly mentions a Mercury, a Discobolus, and a man sacrificing a ram, by him. Paussiut notices six

Chalky character, which, from its having been followed by other members of this clever family, is characteristic of what is called the 'Naucrat School.' Notwithstanding a certain air of coarseness, Peter Nasmyth's landscapes are eminently pleasing. Though he often painted Scottish scenes, and his works are perhaps more admired in his native country than elsewhere, only a few of them were ever executed in the English. His style was not sufficiently massive property to represent the wild mountain scenery and striking atmospheric peculiarities of Scotland. Light clouds, sunshine, smooth water, or small pettering brooks, meadows, gentle rising ground, and green trees, are the objects which his style was best calculated to represent. He died in lodgings in South Lambeth, London, on the 17th of August, 1831, during a memorable period of the metropolis, when the contemplation of natural objects—strong in death—he was lifted up in his bed to behold. (The dates and incidents are taken from Memoir in Lit. Gazette, 1831.)
other of his works: A Hebe, in ivory and gold, placed near the celebrated chryselephantine statue of Juno at Myron's, by Phidias, in the Temple of Minerva at Athens; and four victors at the Olympic games, one of Eucles at Rhodes, two of Chiron, one of which was at Olympia, the other in the Temple of Peace at Rome, and the fourth of Bacchus, all covered with the leaves of the olive. Krates, a rich man at Athens, was once carried in the chariot of Dionysus to the games, and was allowed the company of the victors, a privilege which was considered a mark of distinction and honor.

(Neator, Catalogus Artificiorum, lib. vi, p. 40; Plutarch, Aristas, 13.)

NEBURJ. [Star, P. C., pp. 449, 450.]

NECTANDRA, a genus of plants belonging to the natural order Lauraceae. It has a 6-parted rotate calyx, deciduous segments, the three outer rather the broadest. There 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 pairs, globose, sessile at the base of the three interior stamens next their back. The fruit is succulent, more or less immersed in the tube of the calyx, which is changed into a truncate cup. The flowers are panicled or corymbose, axillary lax and pretty and fragrant.

N. cymbium is a tree nearly 100 feet high, growing in the woods of the Orinoco, near S. Fernando de Atabasco, where it is called Sasafras, 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 liqueur. It is known.

N. cinerariaeoides has oblong leaves tapering into a fine point, acute at the base, between papery and leathery, naked, smooth, and shining above; finely downy beneath, with numerous small narrow coralloid veins. The bark has the smell and flavour of cinnamon, as which it is used in New Granada.

N. Pachyrrhizus major has oblong or elliptical leaves tapering to a narrow point, smooth, reticulated, and of the same colour on either side. The cup of the fruit is very large and spongy. Martius assigned the Pachyrhum bean to this plant. In the early months of the year the fruits drop 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, strangury, &c. The bark has the smell of coriander mixed with that of the plum, and yields the European Jamaica pepper. The bark is known as "Pepper", and is exported to the London shops. It is a native of the woods of Jahuatinga, in the province of Rio Negro in Brazil.

(Lindley's Flora Medica.)

NECTARINE. [Ampelodes, P. C.; Prach, P. C.]

NECTARY, in Botany, a term used by Linnaeus to denote those appendages of the corolla which secrete honey. The term has however, since the time of Linnaeus, 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 of the generic names are more frequently 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 Acetaea, and many others. It is here called the orbevix. When this appendage is accompanied with little projecting processes, they

* These are not the words of Plutarch: he says the feet were under the chariot, and "as they say, 'arxaios, when the figure was painted out." The exact meaning of this word is doubtful. Aristras was not in the chariot; he was standing by it. The word refers to a certain North, who translated Aristras, and who was a painter.
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 corolla appendage. Occasionally there is a second appendage, which alternates with the first, and is called lipula; the circular space at the top of the orbiculus is the scutum. When the lamellae are small and scale-like, and overarch the ovary, they are called a fruit or fructification. Link proposes to call all appendages which are referable to the corolla paracorollae, or, if they consist of several pieces, parapellets, and all appendages referable to the petals, peculiar filament appendages of Passiflora he calls paraphyses or parastmates.

The real nature of these appendages is a point of some interest. Some botanists believe they are the simple excretions 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 nevertheless play an important part in the most valuable of all the distinctive marks for species, genera, and even orders, which the botanist possesses.

The original name, corona, of these appendages was applied to the crown or tiara, which the tenses of these organs frequently secrete. They were on this account called by Meyen compound glands. It was supposed by Kurr that the function of these glands was variegated, and that they only secreted honey till the fruit began to develop itself; and, as 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 by an experiment by Kurr himself, in which he found that the seeds of plants became perfectly matured, although he had in the early stages of the growth of the flower removed the nectaries. As to what may be the determination of the nectary in these organs, 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. [Mineralogy, P. C. S.]
NEGOTIABILITY. [Bill of Exchange, P. C. I]
NEG. OR NEJDJ. [Arabia, F. C. and P. C. S.]

NEUMATUM, a genus of plants belonging to the natural order Nympahaceae. It has many distinct carpels, half immersed in the profoundly honey-combed, obliterated teres, each bearing a style with a solitary seed in each carpel, with a sterile stigma at the destitute of lobes, and the base of which is thick and grey. The leaves are large and showy, white, red, or yellow. Both leaves and flowers rise from the surface of the water.

N. speciosum, Pythagorean 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, smelling of a rose, and generally of a rose colour, seldom white. A variety of this species, Tesserae, has its outer stamens sterile, dilated at the top, winged, obtuse, the appendage rising from a notch at the apex. It is native of Malabar. The flower resembles an insect once used in play by the French, called Lotus, and is one of the plants supposed to be the celebrated Lotos of antiquity, formerly found in Egypt. It was known to the Greeks, and is mentioned as growing in Egypt by Herodotus (ii. 92), Theophrastus, and others. Although not now 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 decisive terms. It is noticed that the sculptured leaves are still preserved, which testify that this species, as the proper Lotos, has obtained religious reverence. It is spoken of as having been used as food by the Egyptians. Both roots and seeds are said to be injurious and to occasion swelling, and to be of service in extreme thirst, diarrhoea, vomiting, &c. In China it is called Linuwa, and the seeds and silves of the hairy root, with the kernels of apricots and walnuts, and alternate layers of ice, were frequently presented to the British ambassador and his suite, at breakfast, given by the principal mandarins. The seed is stuffed in salt and vinegar for winter use. Thunberg says this plant is held sacred in Japan, and is considered pleasing to the deities, that they may be propitious to the large boats. The seeds are somewhat of the size and form of an acorn, and of a taste more delicate than that of almonds.

N. tateum has a polypetalous corolla, and greatly resembles the species just described. It is a 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. speciosum; they all require a very warm situation in a stove.

Don, Gardener’s Dictionary; Burnett, Outlines of Botany.

NEMACANTHUS, a genus of fossil fishes from the oolite and liasian strata. (Agassis.)

NEMERTUS, a genus of fossil Annelids, from the Lower liasian strata of Lamberjack, in South Wales. (Murchison.)

NEMOCERA, the first family of Diprerior insects in the arrangement of Latreille, includes such species as have antennae composed of 18 segments, an exserted hind foot, a sheathed sucker, and either simple or toothed tarsal hooks. It includes the species of Cales and of Lipyla, the names given by naturalists to the Mosquitoe and Crandells. These Linnean genera are now greatly subdivided.

NEOTITIA (nowtia, ‘a nest with the young in it,’ ‘the young themselves’), a genus of plants belonging to the natural order Liliaceae, with a 2-lobed lip disseet at the base; the stigma transverse; rostellum flat, broad, prominent, entire, and without an appendage.

N. Nidus-anis, 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 smooth brown scales. It has no leaves. The spikes are dense, cylindrical, and many-flowered. It is the original Neottia of Linneus, and is native of Great Britain in stony woods.

N. repens, the common Hay-trefoil. (Bullock, A Dictionary of British Botany.)

NEPA, a genus of hemipterous insects of the family Hydrocorisae, the species of which are popularly known as water-scorpions. Their bodies terminate in two long setae, on the tip of which is a minute appendage. The body is covered with a film of air for respiration, when immersed in the water or mud.

NEPETOS, a name used by Pliny from nepos, escorpion, being supposed to be efficacious against the bite of a scorpion, or from Nepos or Nepote, a town in Tuscan, a genus of plants belonging to the natural order Liliatae, and the tribe Nepeteae. It has diverging anther cells, a ringent corolla, the upper lip flat, straight, emarginate, or hifid. The calyx is 6-toothed.

N. Cataria, catmint, has stalked cordate acute leaves, deeply crested and crenulat with a whitish pubescence beneath, dense many-flowered whortles, smooth and glabrous nuts. 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 corollae are white, with a tinge of red spotted with purple. The whole plant has a strong smell between mint and penroyal. 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 observed, as noticed by Pliny, that the scent of the sculpature of 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; hence the old saying of ‘let no cat meddle with your garden; or in words which are not cat 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
As a real aliphatic acid upon cats. Sheep are said to eat it, and thrive well in a light rich soil, and cut off root to root in a moist situation. All of them require a good deal of heat to flower well in this country.

(Don, Gardener's Dictionary; Lindley, Flora Medica; Burnett, Outlines of Botany.)

NET, and Marshal Spartianus,

PETRUS, a Roman jurist who lived under Trajanus and Hadrianus. Spartianus (Hadrianus) 4 states that there was a general opinion that Trajanus once intended to make Neratius Priscus his successor in the empire, instead of Hadrianus. However, this was employed by Hadrianus as he had been by Trajanus. A case is mentioned (Dig. 37, tit. 12, § 5) in which Trajanus acted on the advice of Neratius Priscus, and was commended (Dig. 1, tit. 2, § 2, § 47) that Neratius was elevated to the consulship, but the year of his consulship is not certain.

Neratius succeeded Cælius the father, and was therefore of the school of Proculus. His writings, which are mentioned in the Florentine Index, are fifteen books of Regulae, seven of Membranae, and three books of Responda. There are sixty-four excerpts from Neratius in the Digest. Neratius is often cited by the subsequent jurists. He is also mentioned by Gellius (iv. 4) as the author of a treatise De Nuptiis, but in place of Neratius some MSS. have Veratius in this passage of Gellius.

NERITES, a genus of fossil Annelida, from the lower silurian strata of Lampercht, in South Wales. (Murchison.)

NERIUM (from nöpö, humid, the habitat of species), a genus of plants belonging to the natural order Aporranthaceae. It has many species, of which the best known is N. oleander. In this plant a concentrated fluid is contained, consisting of about 80 per cent of oleander oil, and 20 per cent of oleander resin. The oleander oil is a thick, yellowish, viscid, aromatic liquid, and is volatile, and is used as a base for perfumes, and as a medicinal agent.

N. oleander, Common Oleander, has lanceolate leaves three in a whorl being beneath, the segments of the corolla trisid. It is native of the Indies, in humid places, but has not been found in Europe by the side of streams and the sea coast. The flowers are rather large, and of a bright red colour. This species contains a great quantity of gallic acid, and a decoction of the leaves or bark forms an accurate substitute for tannin, and is employed in the South of France to cure cutaneous disorders. The peasants in the neighbourhood of Nice use the powdered bark and wood of the Oleander to poison rats. Several cases are also recorded of persons having eaten meat rosted on a spit of Oleander wood.

All the species of Oleander are very showy when in blossom;
column of the Austrians, which he drove back into the forest, greatly contributed to the victory. At the peace of Launay he returned to Paris, where he was received with distinction by Bonaparte, who, in order to attach him to him, married Mademoiselle Auguié, a friend of Hortense Beauharnais. In 1803 he was appointed minister plenipotentiary of the French Republic in Switzerland; on leaving that country his personal qualities, which had made an impression on the court, were highly commended to him by his royal master, and in 1804 he was raised to the dignity of a Marshal.

On the renewal of hostilities with Germany in 1806 the direction of the eighth corps of the army was confided to Marshal Ney. A brilliant achievement in this campaign was the capture by storm of the village of Elchingen (October 4th, 1805), in which the Austrians, under General Laudon, 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 consequence of it, afterwards bestowed upon him the rank and title of Duke of Elchingen.

But it was perhaps during the Prussian campaign of 1806 that Ney's military reputation rose to its greatest height. Of the many splendid actions by which he distinguished himself, the most memorable was the taking 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 the hands of the French. In the battle of the Nations near Leipzig, the total destruction of a Prussian corps at Deppen (February 5th, 1807), the combat of Schomütten, by which the retreat of the Russians on Königswart 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 a command in Spain, and he distinguished himself in the various engagements by which Galliéna and the Asturias were subjected. In Portugal, though under the orders of Marshal Massena, the merit of the capture of Chalad-Rodriguez (July 10th, 1810) and of Almeda (August 25th, 1810) have generally been attributed to him. He was also of great assistance to Massena in conducting his skilful retreat, after his failure in attempting to force the lines of Torres Vedras. [Massena, P.C.S.]

The different dispositions however of these two great generals soon brought about a difference 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.

The disastrous expedition to Russia, and the command of the third corps of the grand army, in the course of which he appears to have freely expressed to Napoleon his dissatisfaction at some of his movements, and advised his retreat at the most propitious moment. At the battle of Valence (August 17th, 1812), at the battle of Teutres, and, above all, at the singularly disastrous battle of the Moskow (September 14th), from which he derived his title of False, he eminently distinguished himself, as the sirename by which he was known to the army, of 'Brave or the Brave.'

But it was during the calamitous retreat of the French army that he rendered it the most important service. The details of his 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 militarily unhappiness, and perhaps some personal hostility, corrects several erroneous statements of Ségur. One incident in this retreat is peculiarly characteristic of Ney's intrepidity and personal courage. General Dumas, in whose company he was resting down to breakfast at Ganninhenn, a man in a brown coat, long beard, and a weather-beaten countenance, entered his room, exclaiming, 'I am at last'; General Dumas, do you recognise me?' The general answered him, 'I did not know. I am the rear-guard of the army,' he continued; 'I have fired the last musket-shot on the bridge of Kovie; I have fought for the last hour, and now I am here.' General Dumas, do you recognise me? The general answered: 'The general is himself, and I knew him.'

In the campaign of 1813 Ney displayed his usual courage and energy in the greatly important matter of obtaining the victories of Bautzen, Lützen, and Dresden, the met with some severe reverses, and at the battle of Danemarvik (September 6th, 1813) he was signally defeated by the Russians and Swedes under Bernadotte, then Crown Prince of Sweden. The right wing of the French army, consisting of thirty 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 matters of the day. Ney expanded at length, and 'after a few words led 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. France, vol. ii., 1844], 'explained insatisfactorily 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 he was 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 its principles in a manner so precise they should be within the reach of all military 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 with his family to his country-seat. 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 Besançon. Ignoring the motives of the order, he immediately proceeded to the reduction of the fortress of Besançon, and on the return of Napoleon from Elba. He then willingly undertook the duty which had been imposed upon him to lend his assistance in the organization of the new army of his former chief; and on taking leave of Louis XVIII, he assured him that he would bring back Bonaparte in an irons 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 Aix, where slept at the residence of his brother-in-law, the prefect of the department, who had zealously joined the restored Napoleon, and who made 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 skillfully 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 the facility which he had gratefully acknowledged to be the greatest service 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.'

The order of the day relating to the capture of the bridge had been read to the troops, who received it with the most enthusiastic approbation. His defection was speedily followed by that of his whole army.

On the 22nd 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 overthrow 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, and his gallant charger, who, with militarily unhappiness, and despite his 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 army. 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 that capitulation. The following are the contents of the following article: All the individuals who are connected with the government shall continue to enjoy their rights and liberties, without being disquieted or prosecuted in any respect, in regard to the functions of public conduct or opinions. (Convention, July 3rd, 1815.)

On the 24th of July however appeared a Royal ordinance, in which, among several others, he found himself proscribed as a traitor to the country. To escape the danger he endeavoured to fly France, but was met on the 7th August, at
the château of Bousons near Aurillac. He was at first cited 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 1826. The proceedings were conducted by his eloquent advocates, Berreyer 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.

On 7th December, 1815, the day after his condemnation, an officer presented himself to Ney to communicate to him the sentence, which was to be carried into immediate execution. On his leaving Ney, the mob, who had collected, rushed up and cried suppliantly 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 Peninsula War, vol. ii. p. 405.)

The refusal 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 dismiss without painful feelings. His guilt was self-evident; and never was the penalty of the law 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 clause in the treaty, which states that no person should be molested for his political opinions or conduct during the Hundred Days; it is very difficult to see how this clause could be held as not protecting Ney, who was no supporter of the Bourbons. But however the views of the Blücher concluded the capitulation: their Sovereigns ratified it: Louis XVIII. took benefit from it. How then can it be said that he, as well 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 any other man; true, the Revolutions of 1830, of 1831 and 1832, were more than two only; 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 bands of an independent sovereign, is a glib 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 Schwarzenberg said at Dresden; and subsequent times have unanimously condemned the violation of those two capitulations. Banished from France, with his double treason affixed to his forehead, Ney went to the Atlas Mountains, of the Egyptian tribune of the world his guilt will be forgotten in the tragic interest and noble heroism of his death.' (Hist. of Europe, vol. x. p. 975-977.)

The following works may be consulted for a full detail of the life of Marshal Ney: Vie du Marshal Ney, with Histoire de son Procès, Paris, 1816; Bicé des Générals Français, par Courcelles; Histoire de Napoléon et de la Grande Armée, par Segur; Histoire de l'expédition de Russie, par Chambray; Alison, Histoire de l'Europe, vols. iii. iv. v. vi. x.; Court and Camp of Napoleon; Mémoires de Rapp; Napier, Hist. of the Peninsula War: Mitchell, Fall of Napoleon: Remy critique de l'Histoire de Ségur, par le Gén. Gourgaud. The arguments in favour of his condemnation may be seen in the works of Bellart, the crown prosecutor, Affaire du Marshal Ney, Paris, 1816; SCHRÖDER LIEB. [GERMANY, F. C. P., 1841.]

NICÉRON, JEAN-Pierre, was born at Paris in 1685. He entered the regular order of Barnabites, and devoted himself to the study of languages and biography. He lived a life of quiet incident, and died at Paris on the 8th July 1733. He is chiefly known as the author—or in some parts rather the compiler—of Mémoires pour servir à l'Histoire des Illustrés dans la République des Lettres, of which twenty-four volumes were added after his death. All who have had occasion to study the earlier literary history of France must be under obligations to this work. Important works of modern are necessary very high in criticism, philosophy, or the essential elements of spirited and descriptive biography. Nicéron was however a curious and laborious reader, and in those instances where he exhibits the fruit of his original research, his matter is highly valuable. Many of the livresses hereover 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, sometimes with simple and occasional annotations as elaborate as the most distinguished men of their age. This is a defect sometimes unpleasing, as it generally attains enthusiasm in some particular walk of literature, and marks the original editor for his own taste.' (Napier, Hist. of the Peninsula War, vol. ii. p. 405.)

NICOLAS, ST., situated in 51° 6' N. lat. and 4° 8' E. long., is a large market-place in the province of East Flanders, of the kingdom of Belgium. It has a large market-place surrounded with good bouses, a handsome town-hall, a prison, a tribunal of commerce, and a Latin school. The number of inhabitants is about 18,000, who manufacture cotton and woollen goods of various kinds, hats and ribbons; there are tanneries, potteries, dyu-houses, brick and tile kilns, soap-works, suit-works, &c. There is a great weekly market for corn, flax and hemp, and horses. St. Nicholas is in fact one of the richest and most flourishing towns, not only of Flanders, but of all Belgium. The surrounding country is highly cultivated.

NICOLAS (Nicolas) of Athens, the son of Nicomedes, and the pupil of Antidotus, was one of the most celebrated painters of antiquity. He was, though probably younger, contemporary with Apelles. He is described as the producer of the picture: in elegant design, in beautiful colour, and in effect colour's适应; in fact, in the characteristic qualities of the Bolognese school subsequent to the Cerasi. He also excelled in painting history; but this work fell into disrepute as a result of his mastery over the instrumental and technical parts of art. It is remarkable, though Athens was so long the principal seat of the arts among the Greeks, about two centuries, Nicias and Apollodorus are the only two Greek painters of the greatest fame who were natives of Athens. Yet the case is very similar with modern Rome: of all the great painters of that central city, two only were natives—Giulio Pippi, called Romano, and Carlo Maratti.

The most celebrated work of Nicias was the Naxia, or the region of the shades, of Homer (Homeri Homerum); from the passage of the Odyssey where Ulysses invokes the shades of the dead. Nicias, says Plinius, refused to sell this picture to Ptolemy I., of Egypt, who offered him sixty talents for it; he presented it to his country. If Plinius speaks here of the Attic talent, the price offered was enormous, though not unprecedented in ancient times—about 15,000, according to some computors of money; but whether the amount, which is unlikely, the amount would be diminished to nearly one-fourth.

Nicias must have been old when Ptolemy was king of Egypt; and from his refusal of this offer, probably very rich also, as Pliny says that Ptolemy offered him a thousand talents for the picture of Napoleon, Egypt in 306 B.C., and, Nicholas, about half a century earlier, was employed by Praxiteles to colour some of his statues. Pliny infames a doubt whether the same artist in these two cases is alluded to; and Silius, in his Catalogus Artifictum, has concluded that they cannot be the same. Only one Nicias, however, is known and spoken of by ancient authors; and the only reason for doubting the identity of these two is founded on Pliny's method of assigning their dates to artists and their scholars, mentioning only a single year or Olympiad for each, which, vaguely expressed as it always is, need give us the exact time of an artist within half a century. Yet if we consider enough of the commencement of his career, we make him probably contemporary with a generation of artists who succeeded him; and if we suppose him to have been about seventy years of age, and he was doubtless old, with such a reputation and sue independence, he may very easily have many years before painted the statues of Praxiteles. Praxiteles described, according to Pliny, in Olymp. 104; and if this date is to be understood as the beginning of his career, he was essentially the contemporary of Nicias; and if as the middle, he was about one generation his senior. This is in all probability the case;
for it reconciles all the facts recorded of Nicia, and it is much more probable that Praxiteles would employ a young man to collaborate with his own hand, than that he would use a pupil who was his in name only, a great painter, his equal in age and reputation. Statue-painters, *Psycos* και *Hyrcanus*, constituted apparently a class of themselves, and Nicia may have been one of these in Praxiteles' time. It is more probable, however, that one of the greatest painters of his time should be thus employed. One of Silius' difficulties in identifying these two as one, is, that Nicia was the pupil of the pupil of Euphranor, who was the contemporaneous, if not the original Praxiteles. It is impossible 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 than the pupil. We suppose that if Nicia 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.

Nicia painted in easecue, and besides the one already mentioned Pliny notices the following pictures by him:—an Alexander (Paris), a sitting Calymnus, an Io, an Andromeda, and another Calympo, in the hall of Pompey; a Bucephalus, a Diane, 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 said to have been drawn from Silanetus, (iii. 10), who says that the figure of Hyacinthus was very elegant.

Augustus dedicated and fixed in the wall also a picture by Nicia in the Curia Julia, of Nestor sitting on a lion, holding in his hand a tablet, of which he was substituting an old man, resting upon his staff; above him was hanging a picture of a Biga. It was brought from Asia by Silanetus, and was most probably the same of which a Tarentine ambassador, being asked his opinion, said, according to Pliny, 'that he would not have had it even if he were real and living,' alluding to the old man with his staff: entirely overlooking the art which embodied the picture, and measuring the man apparently by rules, the Lesseps (Lesbia, p. 360, note: *Cicero*), 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 *nema tablet*, called by the Greeks *epitaphion*. Nicia wrote on this picture that he had burnt it in, *Niciae epitaphion*, that is painted it in easecue.

These words were, in the opinion of Lessing, written upon the small painted tablet which was hanging over the head of the old man—νεμεια επιταφιων της ευθειας. *Niclae scriptum est instanter; tali enim 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, and the subject remains, however, as respect to the Neumatic games, because in them four horse-chariots were used. (Schmidt, in *Proef. ad Nemeiaecus*, p. 2.)

Nicia enumerates the poems of the tribute of Augustus, high priest of Epheusus, and one at Tiuma. Pausanias says, before you come to Tiuma from Phravre there was a *Apis* of white marble, which was particularly worthy of inspection on account of the name of Nicia upon it: a beautiful young woman was represented seated on an ivory chair, and behind her was a female servant holding an umbrella; 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 (Nicia was, according to Pausanias, the most excellent animal painter of his time); the names of these people were not known: Pausanias supposed these to be man and wife. Nicia was honoured 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 studious painter. Augustan says he used to forget to take his meals (Var. Hist., i. 31).

It has been said above that Nicia painted some of the statues of Praxiteles: this requires some explanation. Philemon of Praxiteles brings marble statues be preferred, answered, 'those which Nicia had had a hand in; so much did he attribute to his circumlucio.' This word *circumlucio* has been variously interpreted. 'Pacellus' (Pacelli) supposes it to be an application of the clay model; but Pliny is speaking of marble statues, and the circumlucio must have been some superficial application, and cannot be applied to a correction of form; the question is a process which has undergone at the hands of a painter. Cicero has 'Persae mortuorum cera circumlucitos conditum.' (In Tusci, i. 45.) There is a prejudice against the idea that the Greeks painted their statues. It is an indisputable fact, though it was not a universal practice. The statue-painters, χρυσαυτομοικζωνετοι, as Plato calls them, are definitely spoken of by Plutarch (De Glor. Athen. 6.) as *Chrysoautumoeiakrovkteri*, or painters of art itself as *Chrysoautumoeiakrovkteri*. Statues seem to have been sometimes entirely painted, which appears from the following words of Plato (De Rebip. iv. 420. c). He observes, in speaking of the mastic and linseed paint which was used, that the Ionian logicians and Aristotelians, in the dialogue of the Portraits, or Pois, in Lucian; from which it is plain the Venus of Cnidian, by Praxiteles, and other celebrated statues, were not painted, though parts may have been coloured, and the whole body covered with an encasual varnish. (Lucian, Imag. 5-8.)

We may infer therefore in this case that the circumlucio of Nicia, applied to the marble statues of Praxiteles, was the *Chrysoautumoeiakrovkteri*, or some of his pupils.
NICOLL, ROBERT, a poet distinguished by the precocity of his talents, was born at Tullibeltane, 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; but he saved the money he earned by labor of various kinds, and was enabled to purchase books and to acquire a knowledge of those parts of Greece and Rome which he afterwards translated. He had been apprenticed to a grocer in Perth, and at the conclusion of his service endeavoured to earn a livelihood by keeping a small boarding-house. His business was commenced with the least possible expenditure of capital; for 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 1836 he undertook the editorial supervision of the ‘Leeds Times,’ a paper of strongly liberal sentiments; and by the spirit and energy of his political articles, and their adaptation 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. While he was engaged in his duty, he had his hair cropped, and the neighbourhood of Edinburgh, where, amidst the attendances of kind friends, he died on the 5th of December, 1837, in his twenty-third year.

Memoir, by Mrs. Johnstone, prefixed to a third edition of his Poems; Westminster Review, No. 76.)

NICOMACHUS (Nicoiædæus) of Thessalon, son and pupil of Aristarchus, and of Artemisia; he was a painter of the fifth rank, whose works between 360 and 300 B.C. He is classed by Cicero with Apelles and Protagoras, and his paintings are compared by Plutarch with the times 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 Aristatus, tyrant of Sicily, had erected in honour of the poet Telesetes, which were executed in a few days by Nicomachus, with remarkable beauty, and to the entire satisfaction of Aristatus, 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 Aristatus 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 Rape of Proserpine in the Temple of Minerva on the Capitol, hanging above the niche or shrine of Venus or Youth; and a Venus embracing a Youth, with which was dedicated by Piancus; also Apollo and Diana; a Cybele, the mother of the gods, sitting upon a Lion; Bechecantes, with Satyrs creeping up to them; and a Scylla, which was in the Temple of Venus at the entrance of the port of the Tyndarean by Nicomachus; he instances it as an example of the unfinished works of painters being in greater repute than their finished works, when left unfinished through death, or perhaps other circumstances impeding their completion: he mentions four pictures—the Tyndarean of Nicomachus, the Iris of Aristides, the Medea of Timonmachus, and a Venus of Apelles. Nicomachus is the first who represented Ulysses with the pileus or cap of liberty. He is one of the painters from whose error Pliny’s is said to have used only four colours. (See Dictionary of Greek and Roman Antiquities, article Colors.) Cicero, in speaking of these works, says they are arranged in the works of Eucleon, Nicomachus, Protagnoras, and Apelles, all things are perfect. He is, however, enumerated by Virgil among the artists who thought of the greatest ability the works of these master-painters, and of Alianus, who relates of Nicomachus that, bearing some one say that he saw no beauty in the Helen of Zeuxis, he observed—‘Take my eyes, and you will see a master.’ He had several scholars among his celebrated painter, his brother Aristides, his son; Philoheus of Ecretia; Neoepheus; and a certain Corylas. Philoheus imitated Nicomachus in celebrity. Nicocles was a painter of Corcyra.

(Pliny, Hist. Nat. xxxv.; 30, 35; 11, 40; 14; Cicero, Brutus, 18; Plutarch, Tim. 36; Vitruvius, lib. in procœss.; Stoicœ, Ser. 61; Julia, Catalogus Artificrum.)

NIGELLA (from Niger, black, because of the colour of the seeds), a genus of plants belonging to the natural order Ranunculaceæ. It has 5 coloured petal-like spreading sepals. The petals small, from 5 to 10, bilabiate, with a hollow nectariferous claw. The capsules more or less connected to each other, terminal, dehiscing by 4 or 5 teeth, and give rise to the lot of the perennial grass. In the wild N. sativa has ovate obtuse anthers, capsules muricate, united up to the very point into an ovate fruit, terminated by five crest styles; the stem erect and rather hairy; flowers naked. This herb was formerly used instead of pepper; and have also been employed as a condiment. It is the Mallophora of Hippocrates. [Steril.] 675, and of Dioscorides, 3, 83; the Glycy of Pliny, 17, 20.

N. arvensis has pointed anthers; from 5 to 7 styles gradually revolute, outwardly smooth; capsules connected below the middle into an oblong 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. In Egypt they are used in the adulteration of pepper. All the species of Nigella are plants of easy culture, only requiring to be sown in the open border. They are curious and ornamental.

(Don, Garden Dictionary; Linnaeus, Flora Medica; Frag, Synopsis Plantarum; Flora Classica.

NIGRIATIA is a term, which was formerly applied by geographers to that part of Africa which lay between the latitude of 20° N., the name of Stobo with which Arbuthnotian it is only a translation, meaning the country of the blacks. (Soodan, P. C. vol. xxiii.)

NILE. Since the article Nile was printed in the P.C. the course of the western branch of the river, the Bahr-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 Linant. In 1840, 1841, and 1846, parties of Egypt sent three expeditions 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 (10° 17' N. lat.) and as far south as Aleis the Bahr-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 of the trees. There occur a few low hills in this part of the country. The western banks of the river are occupied by the Hmani, a nomadic tribe of Arabian origin, the most southern of this description, a Valet of the same tribe, and wage war against the black tribes who live further south, especially the Shillucks.

South of Aleis begins the country of the Shillucks, which extends to about 10° N. lat. The river is here three miles wide, and contains of 100 or 120 feet. It is overgrown with trees and shrubs, and 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 Arabshali, 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 practical nation of blacks, who frequently descend with their boats in great numbers to the countries lower down the river, and formerly extended their predatory incursions as far as Khartoum, but at present they are kept in awe by the banks of Egypt. Near the southern limits of their territories the country is interwoven with numerous isolated conical hills, among which one called Defa Fung (10° 20' N. lat.) appears to be an extinct volcano, containing a large lake in its crater.

Near 9° 11' the Bahr-el-Abiad is joined from the east by a large tributary, the Sobat, which is supposed to rise in the mountains of Abyssinia, and which flows a course of some 120 miles, parallel to the course 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 Bahr-el-Abiad itself, and well wooded. Soon after the mouth of this river to Khartoum the Bahr-el-Abiad flows from south to north, but higher up it runs from west to east for about a hundred miles, through a country inhabited by another black nation, the Dinika, who are divided
into seven tribes and speak a language different from that of the Shillucks. In this part (between 8th and 9th 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. The current of the river 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 collects in these parts is brought down by a river running from north-west to south-east, which is the only branch which the Arabian geographers is called Kallack. It is also possible that the course of this river has induced them to adopt the opinion that the Behr-el-Abiad rises far to the west. The Disko is a wandering and semi-nomadic tribe, which, live principally on the produce of their herds of cattle, distinguished by large horns like those of antient 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, elephants, giraffes, and hippopotami are met with in great numbers.

Before the Behr-el-Abiad enters this swampy region it runs from south to north, but farther upwards (south of 7th lat.) from south-east to north-west. The country traversed by it is a plain, completely naked, and with even rapids. Its eastern banks are occupied by the Nuers, and its western by the Kys or Kekes. Both nations are cultivators of the ground, but have also numerous herds of cattle. They are not agueous. 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 Kys have also numerous beds of melons, but live chiefly on rice, fish, grain, 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 Binkas.

Farther upwards other tribes are named, as the Heilab, Bhor, and Chir. At last the expeditions arrived in the country of a black nation called the Barrys, where their progress was stopped short by a vast lake, which the river in its width near 4° 42' N. lat. and 50° 38' E. 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 mutta, or king of the Barrys, persons must walk for a month before they arrive at a country called Anyan, where the river is forded by the confluence of four rivulets, the largest of which comes down from the east.

The Barrys are described as a very interesting nation. They possess a peculiar and splendid country. The Barrys is a country well cultivated and exhibits the richest crops, their fields being irrigated by numerous canals. They enjoy a considerable amount of ease, which appears to have a great influence on the frame, constitution, and manners of the human beings. They are in general more than six Paris feet in height, and are well built. They inhabit a great number of villages, consisting of huts built of reeds, and situated either on the banks of the river or at a distance from them; some are built on hills. They cultivate dhurra, sesame, tobacco, and several kinds of melons. No horses, camels, or asses are found in their country, but their cattle are of great size and very numerous; they also have fowls in abundance. Among the wild animals, elephants, giraffes, and antelopes are very numerous. In the mountains lying towards the east iron-ore is abundant, and they have also rich natural implements, knives, and arrow-points. They are also acquainted with the art of tanning and making some cotton fabrics, and working 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 of commerce peculiar to India, as calabashes 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 Berry, and which, as they said, is a day's journey farther east, at the foot of a range of mountains.

The task for us is 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.

(Werne, Uber die zweite Expedition welche auf Befehl des Pascha von Assyrgen Mohamed Ali zur Erforschung der Quellen des Wissen Nils unternommen wurde. In den Mem. de l'acad. des sciences, t. v., p. 80, 1845.)

NIMA, a genus of plants belonging to the natural order Simaroubaceae. It has hermaphrodite flowers, a 5-petalled calyx, 5 stamens, 5 ovary, in a capsule, anthers containing spores dilute at the base; the 5 ovaries are connected together, pilose, and seated on the thick disk beneath the petals. The embryo is large, without albumen. The species are herbaceous, tree or shrubs; among the best known are a number of species differing by sparsity, with pairs of serrated leaves. The flowers are disposed in panicle corymbs.

N. quaissica is a native of Neapal, in a valley near the town called Thahkt. It has elliptical oblong leaves, which are acuminate and serrated. The corymbs are biclinomous. It is as bitter as the quassia of South America.

(Gardner's Dictionary, Lindsay, Flora Medicina.)

NINEVEH. Since the publication of the article NINEVEH in the 'Penny Cyclopedia,' discoveries of the highest importance have been made, not on the precise site, yet in the immediate vicinity of the ancient city, by which the following are some of the most interesting particulars.

For these discoveries we are indebted to M. Boita, consul of France at Mosul on the Tigris, opposite to the presumed site of Nineveh. In the year 1843, announced to his friend the 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 of the town of Khoser (Khasar, M. Boita'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, and which appears to have been a palace. During the progress of the work, with M. Julius Mohi, at Paris, to whom he wrote sixty letters, with drawings of the sculptures and copies of the inscriptions, M. Mohi published notes of the most remarkable, which are inserted in the 'Journal Asiatique,' and they have since appeared in one volume, with fifty-five plates. M. Boita regretted that he was not a competent draughtman, 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. Flindan, an able artist, who had lately returned from Persia, and granted some money to enable M. Boita to prosecute his researches. The following particulars are extracted from M. Boita's letters, and such parts have been selected as may be understood without the plans. He has great deal of importance in the sculptures exposed were thrown in his way by the ill-will of Muhemmet, Yassar of the Pasha of Mosul. All are now happily surnanted, and the excavations are terminated (in 1845). M. Flindan has...
returned, with drawings of 150 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 proceed to France. A large number is now in the Assyrian 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.

From M. Botta's third letter, dated Mosul, June 2nd, 1845.—I return with increasing astonishment from my discoveries at Chorsabad. My operations have again brought to light several of the chief scenes of the monument. On the north wall of the apartment there are, first, some figures, of which only the feet 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 end of this apartment you may see a. On each side of this is a passageway of the same width, but much 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 on several parts of this wall there is a bas-relief of a horseman. There is also a group on 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 varied, and through 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 tiara, 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 the ground all who entered it. On the left of this inscription is a bas-relief of a horseman, which is extremely animated; the horses in particular are very spirited. The harness of the horses is very rich, and has evidently been coloured. These five bas-reliefs are each separated by a perpendicular line at the edge of each slab; and over them 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 inscription is a separate line at the edge of each slab, and 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 are scarcely a few feet without 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 feet square, and scarcely a foot thick. The alabaster is larger and lighter than in Greek sculpture, but higher than the Egyptian. Though rather stiff they are well designed, the attitudes admirable, the musculature strongly marked, and the hands, feet, and figures are admirable. The builders have to be supposed that the building has been destroyed by fire; on the ground were found a quantity of charcoal and some remains of burnt beams.

The surface of the slabs is in many places calcined by fire and fire. There are other portions of a slabs of this kind, which are probably destitute to determine the age of the monument, I shall refrain from all discussion on the subject, and merely state some particulars which may aid them in their researches. Though the hair, the beards, and the costumes resemble the Sasanide modes, I have found no trace of any inscription in a different character; in one part of the building there is no inscription, and some parts of the buildings 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 properly 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 high in proportion. They have five legs each, so contrived that whatever side you look at them, one leg being hid by another, four legs are always to be seen. On the left side of the wall, at 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 to the shoulder. The figure has a neck of great rarely, and is divided into several parts, with fringes. 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 concludes, to 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 interposing 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 proceeded; 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 means to save the most interesting portions.'

In a report to the Minister of the interior, M. Botta says, 'The bulls in Chorsabad, the monument which had been suspended for two months on account of the heat, 'much regret that a great part of the sculptures are already destroyed. The inhabitants have stolen the props which I had placed to support the monument, the moulds 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, and the 200 inscriptions, and the drawings of M. Flandin, will enable the learned antiquarians 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 religion, the art of war, the battles, the fêtes, and the funerals—of the Assyrians. The fact is that it is certain that the bulls have the two horns forming the corners bown out of one piece, and have been cut according to the dictum of this school; but this is not the case. There is a chance that these inscriptions being so placed that they could not be seen while the building remains entire, we need only suppose that their contents are of a halluciatory, religious, or oracular nature, and were purposely concealed, the plates which M. Flandin found in deep recesses in the walls; which could not be got at as long as the walls remained entire.'

* M. Mohl has published only five of M. Botta's letters.
who built Khorsabad, are here delineated in plentiful 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 form is prominent, his epauletts thick; his beard and beard falls 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 or jupon, set off with a rich sable cloak. It resembles the surplice 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 a solemn procession. It is apparently a fragment from one of the statues of theTEAM,7. From the first to the last several figures for females, but afterwards changed his opinion, and thought they might perhaps be mean for eunuchs.

(Lettres de M. Botta, sur ses Découvertes à Khorsabad. p. 195.)

N. nitidus, a genus of fossil fruits, from Speepay. (Bowerbank.)

NISI. [Rule (in Law). P. C.]

NITELLA, a genus of plants belonging to the natural order Characeae. It is characterised by the whole plant being more or less pulvillus; the cells are tubular, not invested with a secondary layer of smaller cells as in Chara; the reproductive organs consist of globules and mucous, mostly sealed on the terminal whorl and axillary.

Four species of this genus have been described inhabiting Great Britain.

N. nitidus has an elongated filicid pulvillus glossy stem, with the branches of the whorls spreading, elongated; the mucous and globules approximate, on the smaller ruellia scarcely bracteate. It grows in deep and stagnant ponds, but is by no means common. It is found in Great Britain, and is the largest or the largest 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.]

N. flexilius has a stem one to two feet long, smooth, flaccid, somewhat glossy and pulvillus. It is not infrequent in lakes and still waters. The mucous 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. nitidus has single stems, smooth below, flaccid, somewhat glossy and pulvillus: the mucous and globules separate. It is a native of the salt water ditches in the south and east of England.

N. gracilius has smooth, glossy, pulvillus stems, with whorls of the branches compound, the segments acute, the branches angular, one or few, deltate and compact species, but probably not distinct from N. flexilius. In fact, it may be questioned whether all these species are not varieties of one.

(Hassall, Freshwater algae; Smith, English Botany.)

NOD 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 end and at another extremity, when the string or column is put in a state of vibration. They are as to remain at rest and the latter as 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 if a string or a metallic cord be attached to 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 respective height, and are generally ascribed to the thicker, or thinner, or more or less thick of the air, and are conceived to result 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 one another in the proportions of the whole length of the string, at which points a contrary in the directions of the vibrations of the string the latter in a state of rest. Such are called nodal points; and they may be considered as the centres of attraction or repulsion in the thickness or density of the string, or of different degrees of flexibility in its different parts. The string between every two such points is in the same condition as if it were composed of two separate strings, whose vibrations are consequently such as are due to the distance between the points, and hence arise the secondary or harmonic sounds.

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 nodes remain motionless, while the others experience agitations, or are thrown entirely off.

If a string, in a state of tension, have its extremities attached to a board or a plate of metal, and be made in some part of the string into a circle, or a semicircle, or a longer length, the string, if it be not bent, the vibrations of the string, when a violin-string is drawn across it, will be communicated to the plate; and if over the latter light dust be strewed, that dust will be agitated and made to arrange itself on lines at which the surfaces of the plate is 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 the plate, or the like metallic, and be communicated, for example, with a wet cloth, so as to be put in a state of vibration longitudinally, those vibrations will be communicated to the dust, and light dust strewed 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-string across its edge, the vibrations of that disk will, by means of the rod, be communicated to the other; and if light dust be strewed over both it will arrange itself in figures: when the dusts are equal and similar to one another, the figures will be similar both; otherwise there will be a difference.

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 assume a state of equilibrio. It is the largest 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.]

VIBRATION, P. C.]: those portions are separated from one another by sectional areas in which the particles are at rest; the condensations, or rarefactions, of the air being, in those areas, greater than in any other parts of the tube in consequence of the particles moving in contrary directions, and with equal velocities towards, or from, them. Such areas are called nodal sections, and several may exist at the same time in the tube. Their existence is rendered evident by boring small holes in different parts of the sides of the tube and covering them with pieces of thin paper slightly adherent to the sides of the tube, when the particles in the nodal sections become slightly agitated, while, in the intervals, they will be greatly agitated.

If, 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.
found to take place parallel to the surface, and other 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 ("Dialoghi della Scienza Nuova") that the vibrations of plates might render audible the vibration of solids. He therefore 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 Wittenberg, 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 on each side; if circular, their diameters may be within the same limits. In making experiments on the plate, it 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 sawdust; and it may be set 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, the place at which the bow is applied, and that at which the plate is held, up to a square plate 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 direction 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 the three lines parallel to one another; and if the plate be held at a point near the edge, the lines will become curves, as in No. 4.

If a circular plate, held at the 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 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 be held at one point, with its edges, and is sufficiently thick, be held horizontally between a finger and thumb at the middle of its opposite edges, and it 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 if the plate be turned with its upper face downwards, being held as before, the dust which falls on it, and rises from the points of contact, will be dispersed in the manner described above, the places of the nodal lines will be opposite to the middle of the intervals between the lines observed in the other position of the plate; Chladni's experiments prove that the motions of the particles in the 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 plates of glass have been made to vibrate longitudinally; the lines of nodes then take a spiral form about the thumb and finger, 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 80 degrees 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 quadrant portions, having opposite qualities. The places of the nodes on one 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. Berthelot read to the Académie des Sciences at Paris, an account of some curious experiments in which acoustical figures were produced in consequence of vibrations communicated through the air to elastic membranes. (Browsee's Edinburgh Journal of Science, vol. ii. p. 298.) A sheet of this paper was held at the centre of a circular plate of glass, four or five inches in diameter, and on it was strewn light dust. A thin circular plate of glass, in a state of vibration, was then brought within a few inches of the paper, when 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 on its circumference by holding it at the thumb and a finger of each hand, placed the tip of another finger at a point on the surface, at a distance from the centre equal to about one-fifth of the diameter, and caused the plate to vibrate drawing a violin-bow across its circumference. In these circumstances, on presenting the plate to the stamped 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 fixed perpendiculariy between them. If 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 evinced 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, warmly espoused. During the Reign of Terror young Nodier obeyed the call of his country to 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 serious pursuits. The beneficial consequences of his advice became manifest, when, five years afterwards he published a work of considerable research and great critical acumen, entitled "Le Dictionnaire des Oubliettes," a curious dissertation on words which derive their signification directly from the action which they represent (souper, 'a name,' and soupe, to make), as the verb to hiss in our language, and is 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 Mons. de Chantrast, a Royalist officer, who was compelled to seek for safety in a retired country-life; through his exertions Dôle had been enabled to solicit the natural history of which he afterwards devoted a considerable portion of his time; it was especially to the minute examination of insects and flowers that he was attached, and his taste for them is strongly marked by his after-product. In 1796 he published 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 went to Paris, where, furnished with the munificence of his countrymen, he was admitted into the best literary societies of that time. Two years afterwards he retired to his native town; but soon becoming wearied of the monotony of a provincial life, he sought for novelty in the society of the poltroons and sceptics, and 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 Lévis in Lorraine, with the promise of a salary of 500 francs in return for his services to the public. In 1809 he was elected a member of the Academy. His first important writing was the 'Contes de la Salle de Justice,' which appeared in 1811. The book was a complete overthrow of the political system of the Bourbon dynasty. It was pronounced, and was so considered by the French government, that it was prohibited from being read. The work 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 contributed to the journal 'Le Moniteur de Dôle,' which appeared every week, the history of the town, to which it was attached the small salary of 1000 fr., about 40l. a year, but the corporation, with a regular want of discernment, had refused it to him. In Paris he published a military history of the war in Lorraine, and composed, in 1812, 'Lettres de la Salle de Justice.' The next year he published the second volume of the same work, and under the name of 'Monsieur Nodier,' continued to contribute to the 'Journal des Débats.'

Nodier's early literary life was marked by great activity. He published in 1815 the first volume of a work which he intended to be a complete history of the French revolution. In 1816 he published his 'Vie du général Drouet,' and in 1817 his 'Histoire des Passions.' He also published a work on the history of the French revolution, and a work on the history of the French republic. In 1818 he published a work on the history of the French revolution, and a work on the history of the French republic.

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NOLNA (so named by Linnaeus, from nola, a little boat, like the bulbs of lilies, and nolani, the tribe Nolanae.) is a genus of plants belonging to the natural order Solanaceae and the tribe Nolanae. It has a 6-angled calyx, a campanulate 6-lobed 6-locular corolla; 5 stamens adhering to the tube of the ovary; 5 ovules in each cell, adhering at lengthwise. The seeds are roundish, with a membranous testa, and showy copious albumen. The species are herbs, native of Peru and Chili, usually annual. Leaves alternate, quite small; the flowers are solitary, pedunculate, and of a showy blue colour.

N. prostrata, prostrate Nolina, has a prostrate stem, ovate oblong leaves, a pyramidal calyx, with triangularly sagittate acuminate tips, about three-eighths an inch in length, and a few flowers at the top, but none on the stem. It is a native of Peru, but grows freely in this country in the open air. In France poetry is fed upon it, and it is so fond of it that Peronoon proposed to call it N. gallinaeosa.

N. paradisiaca has prostrate hairy stems, ovate oblong pilose leaves, the segments of the calyx triangular, the corolla campanulately funnel-shaped, the drupelets cumulated, 1-seeded. It is native of Chili, on the sea-shore about Concepcion. The flowers are blue.

The species of Nolina are only valuable as ornamental plants; they are showy when in blossom, and are much used as some of the trailing species of Convolvulus. The seeds should be sown in spring, and the plants when of sufficient size or about the middle of May 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 in September (Doce's Gardener's Dictionary; Barnett's Outlines of Botany).

NOLLET, JEAN ANTOINE, a distinguished French philosopher, was born at Paris, in the year 1705. In 1733 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 prosecute the study of theology; but his taste inclining him to cultivate the physical sciences the intention was abandoned, and he was never afterwards connected with the church but 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 possessed many of his leisure hours in the practice of enamelling; and he is said, at one time, to have superseded the education of a son of M. Talbot, who held the post of recordar.

Nollet felt 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 those which have been considered the most important, and induced him to make use of his valuable apparatus. He was the first who observed that pointed bodies, when electrified, give out streams of light, but did not exhibit in other respects much greater effects than those which had before been observed on 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-lac, turpentine, or sulphur.

He ascertained that an excited tube 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 more strongly excited in the air than in vacuo; and that all of tarrying on a wooden wheel was capable of producing the electric fluid in abundance: he observed also the diffusion of the electric light in vacuo. He discovered that electricity augments the natural evaporation of fluids, and that the effect is the greatest when the fluids are contained in non-electrical vessels.

In repeating the experiments of M. Bozzi on the effects of electricity in promoting the discharge of fluids through tubes, Nollet found that no acceleration took place when the bore of the tube exceeded 1/16 of an inch in diameter; he ascertained however that if the bore was very small the electrified fluid divided into several streams and acquired considerable velocity, preserving its direction. He observed that the experiment was performed in the dark. He electrified, during several days, the mould in a garden pot, in which seeds had been sown, continuing the operation three or four hours each day; when it appeared to have ripened the plants and shoots earlier than the plants obtained from the like seed in a pot containing the same kind of mould, but which was not electrified. Nollet also performed an experiment on a large number of plants, the flowers of which were similarly affected, and he imagined that the animals were lighter than those of the same kind which were not so treated: from hence he concluded that electricity increases the insensible percolation of sap out of leaves, and it 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 verifying the conclusions of the French philosopher; and it may be added, that the attempts which have recently been made to promote the growth of vegetables by an apparatus for conveying to the ground the electric fluid in the atmosphere, have been entirely failures.

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 1739 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 the presence of the Duke of Savoy. In 1742 he was invited to Bordeaux, where he delivered a course of lectures; and he was credited with having discovered 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 performed others on the structure and consists 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 had two motions, viz., an affinity 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 repelled by it. Hence he 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 Fischi, 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 had been electrified.

In 1748 he was stated to be in bed with a fever; and he was 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 the smell of cloves, thyme, sweet bay, bay, and phur or emonored enclosed in the globe of the machine. These extraordinary reports induced the Abbé Nollet to make a journey to Italy for the purpose of obtaining information respecting the nature of the experiments; and the result of his inquiry was that, though in some cases the patients might find relief from electricity, its effects had been greatly exaggerated. All attempts in England to obtain results corresponding to those which were said to have been produced on the continent entirely failed; and the reports of the pretended cures soon ceased to obtain credit.

In 1756 the king of France founded 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 which was afterwards removed to Meudon.

He died April 24, 1770, in the Louvre, where the king had assigned to him a suite of apartments; the amability of his character was equal to his talents; and it is said that he devoted nearly all the profits of his labours to the support of the poor.

Best known is the Royal Society of London and a Member of the Académie des Sciences at Paris, he was a Member of the Institut of Bologna and of the Académie d'Érlog.
NOR FOLK ISLAND PINE. [Araucaria; P. C.]

NORMANDY, CUSTOMARY LAW OF.

In 1668, the Most King of France divided his dominions into provinces, and all then appearing in the All tourists to the province which was the chief place of the canton of Gravelines. The town has some historical interest from the defeat of the French in A.D. 1668 under the Duke of Berwick, and the French were assisted by some English ships that were off the coast.

The town was situated in the region of the present-day town of Gravelines, which is a church, a nursery, a military hospital and barracks. The population of the town is approximately 4,419; by that of 1866, 4,462. 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. 1668 under the Duke of Berwick, and the French were assisted by some English ships that were off the coast.

MALTE BRUN. GEOGRAPHY: Vaseau du Villiers, Historique Descriptive de la France; Annuaire du Dép. du Nord; Tableau de la France; Dictionnaire Géographique Universel.

The town was situated in the region of the present-day town of Gravelines, which is a church, a nursery, a military hospital and barracks. The population of the town is approximately 4,419; by that of 1866, 4,462. 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. 1668 under the Duke of Berwick, and the French were assisted by some English ships that were off the coast.

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The modern or reformed 'Coutumier de Normandie' is revised into 34 chapters, which are subdivided into 523 articles, as Rouen on 1st July, 1585, by commissioners appointed by Henry III. of France with the concurrence of the provincial authorities known as 'les gens des trois états,' or three orders representing the nobility, the clergy, and the bourgeoisie.

Among the peculiar customs of Normandy was 'la clameur de Haro,' which custom still prevails in the Channel Islands, where the Norman ancient custom is the principal law. [Alençon, P. C., and C. B., Jany, p. 46.]

The 'Clameur de Haro' may be denominated a call upon the supreme authority for justice, 'appelation ad principem ad opem in lite ferendam.' The term is considered to be derived from Duke Rolle, as the name is variously spelt, Rou, Rou, and Roux, to whom Normandy was ceded by Charles the Simple of France, in 919. (Du Moulin's Hist. de Normandie, lib. i. c. 2, and ib. vol. exp. 20.) So that 'Haro' is a corruption of the cry Hal, or La Roux, by which this prince, who was re-markable for his justice, is said to have been invoked. It is thus practised in the Channel Islands: when an individual considers that another is making a trespass, or is infringing upon the rights of another, he applies to two witnesses, who protest against the proceedings, and, crying out three times 'Haro,' in the queen's name summons the trespasser to desist. He then applies to the judicial authorities, declaring what is termed 'une censure,' an examination by the court of all the circumstances of the case; be afterwards brings an action against the trespasser. If he neglect to do so, then the person against whom the 'Haro' was cried may bring his action against him, who cried it, and oblige him, if he cannot justify his proceedings, to desist and submit to the judgment of the court. Upon the action of either of the parties the decision is generally referred to what is termed 'une instance,' an examination by the court of all the circumstances of the spot itself.

Whichever of the parties is condemned, he is subjected to a small fine to the queen and pays all costs; in addition to which he was formerly liable to be 'tied by law,' that is, 'gard de château,' that is, twenty-four hours' imprisonment; the impounding of the goods on the principle of causation and the invasion of another's possession being accounted equally criminal. In ancient Normandy parties resorted to the 'Clameur de Haro' in cases of assault and battery, but that part of the custom has never prevailed in the Channel Islands.

The president or chief judicial officer in Guernsey is still styled bailiff, the name by which he is designated in the ancient 'Coutumier de Normandie.' In Jersey he is styled bailey, by which name he is designated in the modern custom of the same island. In Alderney this officer is styled bailey, by which name he is designated in the Channel Islands. The minister or his deputy is the grand bailey, an officer whose authority is of the same nature as the bailiff, and is his superior. The bailiff has a bailey, a bailey officer, in each of the parishes, wherein it is stated that the bailey is intrusted by the prince or the bailiff himself to manage the different matters depending on him, and that he is responsible to the superior for the manner in which he discharges his duties. It is his duty to maintain order, to decide according to law and usage all disputes arising between parties residing within his jurisdiction; and to put down all thieves, incendiaries, and other malfeasors.

It was remarked at the commencement of this article that the different provincial customaries had been frequently commented upon. The first commentary on the Grand Coutumier of Normandy was written by Rouillé, a jurist of Alençon. (Guillaume de Rouillé, Commentaire sur la Coutume de Normandie, fol., 1584, reprinted in 1598.) It was followed by that of Terriére de Dieppe, which was published in 1744, after his death. (Guillaume Terriére, Commentaire sur les Coutumes civi- ciennes de Normandie, fol.) The former is more generally received as an authority in Jersey, and the latter in Guernsey. These commentaries, though they have not given to their au-thors the reputation of a Bourbon, the president of the par-lament of Brittany, or the Arzégaud de Brittany, were held in high authority by the parliament of Rouen. After the revision of the customary in 1585, several modern commentaries were made of Bérenger, Sebag, Godofrey, Fauët, Fausse, and Howard. That last-named commentator has, at the end of the fourth volume of a work entitled 'Dictionnaire Analytique, etc., de la Coutume de Normandie,' issued in 1782, published, we believe,

for the first time, from a manuscript lent him by the Marquis de Paulyn, 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 the name of its author:

'Mait Dieu nous en grant bien vouloir, 1782
Après ce que Jésus Christ vient
Et temps houard lémosigné
Pour rendre nos monsitieus,
Es moynt ses peopleus.
He' Adam noss tolitz julis,
Quest monde versis for yrs;
Mit Richard Doubrueu les livre
En rhime en meeus qui petit
Per les moult gens de son art le plus.

There appear however at the end of the MS. of the Marquis de Paulyn, which did not contain the above prologue, the following lines:

'Quel mon nom vuait apprevend'
La sigilleg et pour ne voie,
Oli et me C, A, P, H, P.'

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 that which the author has given:

'coutumes ce sont ceux usages
Approprées par les Princes seignes,
Incendiaries gens qui ont fait ou commis,
Ces qu'on s'y doit tolérer;
Des autres feux de la main
Des autrui droits et souverainets;
Des droits qui vient d'e'tats,
Et des coutumes, sont ces ues,
Receptacles, autrui communes.'

CHAP. IV.

The following are the best editions of writers on the subject of the Coutume de Normandie:

— Décisions sur chaque article de la Coutume de Normandie, et observations sur les usages locaux de la même Coutume par Pierre de Mervielle, Paris, 1731, fol.; Béraud, Josias, an advocate of the parlia-ment of Rouen, born 1658, died 1699; Commentaire sur la Coutume de Normandie, Rouen, 1814, in fol.; Bérenger, Henri, born 1616, died 1655; Commentaire sur la Coutume de Normandie, Rouen, 1787-1818; Godofrey, Françoise, 'Coutume du Pays et Duché de Normandie avec les Commen-taires de Béraud, Godofrey et d'Aviron,' Rouen, 1864, 2 vols. fol.; Fauët, Jean Bapiste, born 1711, died 1783; Explication de la Jurisprudence et de la Coutume de Normandie, 2 vols. fol.; Fausse, Coutume de Normandie avec les observations de Roppe,' Rouen, 1759, In 4to.; Howard, David, born 1726, died 1803; Traité sur les Coutumes Anglo-Normandes, Rouen, 1778, 4 vols. fol.

Hale, in his 'Decisions of the Common Law of England' (chap. vi.), maintains that the 'Coutumier de Normandie' was written long after Glanvill's tract, which was written in Henry the Second's time; and that the Norman collection was made after the time of Hale. He appears to have accepted this notion of his coronation, and appointing it for the limitation of actions ancestral, which must at least have been thirty years after. Nay, the '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 Richard I. for the limitation of actions, which was after the said Philip's full possession of Normandy.' Hale's opinion is, that 'this similitude of the laws of England and Normandy was not by confirmation of the laws of England to those of Normandy, but by confirmation of the laws of England to Normandy.'

NORONHA, FERNANDO DE, a small group of islands, belonging to Brazil, and situated in the Atlantic Ocean. The fort Concepción on the principal island is situated 32° 50' N. lat. and 32° 26' W. long. The group consists of two islands of moderate size, Fernando de Noronha and Dos Rotes. The soil is stony, and there are only a few small spots susceptible of cultivation. As there is no harbour, and the surf runs high on its shores, landing is difficult and sometimes dangerous. It has good water. The islets of the group are however too high to 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 Islad des Ratas (of the rats), which is three miles long, less steep and more wooded. These islands are used by the Brazilian government as a place of deporta-
tion, and containers amounts to about eight hundred, and the Garrison consists of two hundred black soldiers. They cultivate a small
quantity of mandor, a few fruits, and a little corn, and keep some domestic fowls. That island enjoys the same advantages as the other islands, and the sea-birds of which they are fertile
houses, are numerous. No boats are kept on the island, and no intercourse is held with shipping, without permission and the strictest in-
structions.

(Henderson’s History of the Brazil; Narrative of the Sur-
veying Voyages of the Adventure and Beagle.)

NORTH, SIR THOMAS, Knight. We regret that we have not a single line relating to Sir Thomas North, a biographical notice of Sir Thomas North, the first translator of the Lives of Plutarch into English. North had previously published two other works—1. The Diaries of Prince; compiled by the Reverend Father in God, Dom Anthony de Guaram, and
Engheshed out of the Frenche; right necessary and pleasant to all gentlemen and others which are lovers of vertue,
London, 1547, folio, 1559, folio, 1569, 4to. 2. Referr’d
of faults in the first edition, with an amplification also of a fourth book annexed to the same, entitled the Favoured Courtier; never heretofore in our vulgar tongue; right necessary and pleasant to all noble and vertuous persons.
3. The Most Philosophical Discoveries of the several
sancient writers; a work first compiled in the Indian Tongue, and afterwards reduced into divers other Languages; and now
lastly Engheshed out of the Indian, London, 1570, 4to. Wat
observes in his preface, Dom Doni was so insensible of the in-
that of Magi, a strange blender of the learned bibliographer.
Doni is the name of an old Italian writer, and the original
work is called La Filosofia Morale del Doni, treatt’d stag-
children of the earth, or, Amyot’s writ, Amyot,
scrivta da Sedebard, morassimo Filosofo Italiano, Venice,
1532, 4to.

North’s translation of Plutarch was made, as he states in the title, from the French version of Amyot, which is gene-
really very exact, and has considerable merit in point of ex-
Indeed it is said that Amyot’s translations did much towards raising the French language. Amyot’s dedicat-
Henry II. of France is dated 1545. North’s dedication to
Queen Elizabeth is dated January 6th, 1579; his address to the
Reader is dated January 34th, 1579. North’s version is
can anyone, that of Amyot’s is correct, which is somewhat
strange, for he tells us that he translated Amyot. The
book, besides the Lives of Plutarch, contains The Lives
Epaminondas, of Philip of Macedon, of Dionysius the
conquered, of Numa Augustus; and The Lives of
Authors; also The Lives of Nine excellent Chieftains of
Warre, taken out of Latine from Eusebius Probus, by S. G. S.,
by whom also are added the Lives of Plutarch and of Seneca;
good, and considerable. These works have now been 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
or kind of assistance, as he says, ‘The princely bounty of your blessed hand (most gracious Sover-
igns), comforting and supporting my poor old decaying life, of
right challenging the travel of my study, the labor of my
body, and the prayers of my devotion, to be wholly employed for your Highness, and altogether dedicated to your service.’
(Watts’s Bibliotheca Britannica; Biographia Universelle, article Doni.

NOBLE 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 1643, and was acquired the Master of arts at Christ-Colledge, at school at Laleworth, where he appears to have been taught some rigor Presbyterian principles, which left very little trace on his mind in subsequent life. In 1648 he was
admitted a Fellow of King’s College, and was afterwards a master of St. John’s College.
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 intellect, by eloquence, by presump’tion, by wealth, power, and distinction. His relaxation consisted of music meetings, hearing Hugh Peters preach, and occasional convivial suppers with fellow-students—very small items of dissipation, the nature of the times and the habits of the young
lawyers of the Restoration considered. He was well-con-
connected, and received some aid and assistance from his relatives
in his early struggles. His practice however was for some
years at this time, and probably in disfavour among learned men;
or rather in so much despis’d when he was taken in hand by Sir Jeffrey Palme, the attorney-general, who in the character of the young barrister something for which the crown lawyers of such
quality as Dr. Selden, Dr. Leland, and others, in the reign of
WILLIAM and MARY, were in some measure degraded, and the
propriety and usefulness of the practice of the law in the hands
of men, and when none would starve with him in journeys, this
young gentleman kept him company. The memoir of the
lord keeper by his brother, Roger North, is one of the most
ample 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
paltry and dishonest tricks, his insatiable selfishness, his moral
cowardice, his trimming 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
interests these qualities as prudential virtues, and exhibits them
as that which the French called the honest gentleman, or the
character that Lord Campbell seems rather disproportionate when the nature of the times is considered. The
brother is particularly instructive in describing his at-
tempts to obtain a rich office, by making hearty commendations
on the skill and intrepidity with which he followed every effort
to ally him to anything under the desired standard of wealth.
Other publications appear not to have given him much con-
cern. One curious communication is a recommendation to
him a recommendation of a lady, who was only daughter of
an old usher of Gray’s Inn, 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: thenceupon he made the old
man a visit, and a proposal of himself to marry his daughter.
There appeared no symptoms of discouragement; but only
the old gentleman asked him what he intended to settle on his father—intended to settle upon him for present maintenance, justitute, and pro-
vision for children. This was an insauspicious question, for
the young gentleman was placed in his father’s office, and
ship, and some 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 him again.’ This was the answer of the old gentleman.
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 that time a stout heart, and could not digest the being
so slighted, as if, in his present state, a profitable profession
and future hopes were of no account. If he had had a real
estate to settle, he should not have stopped so low as to match
with his daughter; and thereforeforth despised his alliance.’
He brought himself into notice at court by pleading against
the privileges of parliament in the Writ of Error brought
into the House of Lords upon the judgment of the King’s
Bench in favor of the possessors of the preeminence in that
for holding the Speaker in the chair. On this occasion he
was rewarded with a silk gown. On the 20th of May, 1674,
he was made solicitor-general; and on the promotion of Sir
Sampson Heath, he was made the Attorney General on the 13th of November, 1678. On the 20th of January, 1676, he was made lord chief justice of the Com-
mon Pleas. This was at the period of the curious disputes
in the Court of Chancery between the King’s Bench and the
King’s Bench, founded on no higher motive than the fees
paid by the litigants. The King’s Bench had engrossed so
much business by the fictitious use of the writ of ‘arrantis,’ that
this was the principal cause of enmity; and the possessors of
their coming to Westminster Hall every day in the term. North retaliated by a dexterous use of the ‘capias,’ and
we are told that after this process came into common use, it is scarce to be conceived how the court revived and
flourished, being, instead of vacation in term, rather term in vacation; so large was the increase of trials by mist primus 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 the crown. It was bound to play a large part in the judicial reform.

On the death of Lord Nottingham, the great seal was con

NORTH, ROGER, the third son of Dudley, Lord North, was born about 1740; he was not a man to be easily dazzled to lose sight of his own ultimate interest. Knowing that, from the difficulty felt by the king in obtaining parliamentary supplies, it was intended that the new lord keeper, Lord North, should be his instrument, and conscious that he was the only person who had at that juncture a substantial claim on the appointment, he refused to touch the seal, until, for his majesty's honour, they were accompanied by a pension of 2000L. 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 still less scrupulous instrument of power was however gradually undermining him in his latter days in the person of Jeffreys, whose ascendency and presumption seem to have completely broken the spirit of the lord keeper. He kept a sharp look out for having attempts to militate against the cruel acts of Jeffreys's campaign; and 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 be of his instrument. He died on the 9th of September, 1665. He wrote in his 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 says, he had made as much law as he could contain, but he was incapable of taking an enlarged and commanding view of any subject.'

(North's Lives of the Norths; Campbell, Lives of the Glouchesters, III. 449.)

NORTH, SIR DUDLEY, the third son of Dudley, Lord North, Baron of Kelting, was born on 16th May 1641. In childhood he was lively and active, and having strayed from hall exercises, spent a young age in giggling and prattling, with the additional sin of being a wild boy, 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 ' bond to a Turkey 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, which is full of interesting characters, and suggests 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., and kept the King informed, which 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 professes 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 on his way home having touched at Smyrna, left that place on 25th March 1800. He wrote, as to his journey homeward, 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, and was afterwards elected alderman of Basinghall. He lived in London, the north end of the town with which 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 Commissioner of the Treasury, but on the accession of James II. he was banished, with the rest of the court. He spent his last days in France, where he himself somewhat unpopularity 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 oblige him the merit of having opposed resistance to the crown under the operation of closing.' He lost his office at the Revolution, and was suspected to be a pretty strong examination by both Houses of Parliament. He died on 31st December, 1691. (North's Lives of the Norths.)

NORTHUMBERLAND 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° and 69° N. lat., and is more than 60 miles wide. Hence it extends in a northward direction, with a width increasing 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 Commissioner of the Treasury, but on the accession of James II. he was banished, with the rest of the court. He spent his last days in France, where he himself somewhat unpopularity 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 oblige him the merit of having opposed resistance to the crown under the operation of closing.' He lost his office at the Revolution, and was suspected to be a pretty strong examination by both Houses of Parliament. He died on 31st December, 1691. (North's Lives of the Norths.)

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Thus, But.
3. Tertiana Adipsia.
Flaulota.
N. Ophthalmia Sauvages,
2. Aquoxr.
Appetitut
ing
But
orders,
followed
thirty
fever,
that
however,
been
assigned
a
plan
for
the
purposes
of
classifying
peculiar
forms
of
fever,
but
the
causes
and
the
locally
were
employed;
thus,
mush,
jail,
and
other
fears
have
been
described.
In
this
way
the
materials
were
early
accumulated
for
a
system
of
nomenclature.
It
was
not,
however,
still
comparatively
modern
times,
that
anything
like
a
scientific
system
of
arrangement
was
proposed.
One
of
the
earliest
of
those
was
that
of
Sauvages,
who,
taking
the
most
prominent
symptoms
of
diseases
as
his
guide,
divided
them
into
ten
groups
which
he
named
Vita,
Febres,
Phlegmasia,
Spasm,
Anhelationes,
Debilitates,
Doloros,
Vesane,
Fluxus,
and
Cachexia.
Under
classes
were
arranged
various
orders;
thus,
the
first
class
arranged
the
orders,
Macule,
Ectoereticia,
Phymata,
Excectoereticia,
Cystides,
Ectopie,
Plagas.
The
order
Macule
was
divided
into
the
diseases
Leucosoma,
Vitiglo,
Ephelis,
Utines,
Nau,
and
Ecomyosoma.
This
classification
of
diseases
was
followed
by
those
of
Linnan,
Vogel,
Sager,
and
Macbide,
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
Nasologiam
Medicae.'
The
following
plan
will
give
an
idea
of
its
structure:

### CLASS I.—PYREXIA.

<table>
<thead>
<tr>
<th>Order I.</th>
<th>22 Odontalgia</th>
<th>23 Podagra</th>
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<tbody>
<tr>
<td>Fuerez.</td>
<td>24 Arthropoits.</td>
<td></td>
</tr>
</tbody>
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#### § 1. Intermittentes.

1. Tertiana
2. Quartana
3. Quotidiana

#### § 2. Continuous.

4. Synoche
5. Typhus
6. Synocho

### ORDER II.

**PLEMBASMA.**

7. Phleposis
8. Ophthalmia
9. Phrenitis
10. Cynanche
11. Pneumonia
12. Carditis
13. Pericarditis
14. Gastritis
15. Enteritis
16. Hepatitis
17. Splenitis
18. Nephritis
19. Cystitis
20. Hyperastitis
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### CLASS II.—NEUROSES.

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<td>41 Apoplexia</td>
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<td>42 Paralysis</td>
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<tr>
<td>43 Paralysis</td>
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<td>44 Syncope</td>
<td>57 Collis</td>
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<td>45 Hypochondriasis</td>
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#### Class III.—CACHEXIA.

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<td>69 Polyserosis</td>
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<td>70 Pneumatoxida</td>
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<tr>
<td>71 Tympanites</td>
<td>83 Syphillis</td>
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<td>72 Physomeetra</td>
<td>84 Scorbutus</td>
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<td>73 Ansema</td>
<td>85 Elephantsis</td>
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<td>74 Hydrophoeasis</td>
<td>86 Lepra</td>
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#### Order III.

**CLASSE III.**

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<td>130 Gonorrhoes.</td>
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#### ORDER III.

**DYSOREXIE.**

| 108 Aphonias | 140 Hernia |
| 109 Mirtias | 141 Prolapus |
| 101 Picas | 142 Lusatio |
| 102 Satyrrias | 111 Paraphonia |
| 110 Nymphenias | 111 Pseudanias |
| 103 Nymphenias | 112 Strabismus |
| 114 Aristocas | 113 Hydritis |
| 104 Nasia | 115 Hydritis |
| 105 Aspasia | 116 Hydritis |
| 106 Adipsia | 117 Hydritis |
| 107 Anapodia | 118 Hydritis |

### ORDER III.

**DYCHIEMIE.**

| 108 Aphonias | 140 Hernia |
| 109 Mirtias | 141 Prolapus |
| 110 Paraphonia | 142 Lusatio |
| 111 Pseudanias | 111 Pseudocon |
| 112 Strabismus | 113 Hydritis |
| 114 Aristocas | 115 Hydritis |

### ORDER VII.

**ECTOPIE.**

| 143 Vulnus | 144 Ulus |
| 145 Herpes | 146 Tinea |
| 147 Pueror | 148 Fractura |
| 149 Caries |
It was the simplicity of this system which recommended it in general adoption, and which has caused it to exercise a great influence over other systems of botany. At the same time it will be seen that this and the previous systems are purely artificial, and frequently bring together diseases of a very dissimilar character. Such systems can also led to the misconception of a character as definite as the objects of natural history, and that a species in the one can be as easily defined as the species of another. But it becomes evident, after a careful study, that the exception of those diseases that depend on peculiarity, no part of the idea of a species as applied to plants or animals can be made use of to designate particular diseases.

1. The fundamental principles of anatomy, physiology, and pathology, many attempts have been made to give a more natural arrangement of diseases than that of Cullen. Dr. Mason Good divided diseases into the following six classes:—

**Class I.**—Constitution: Diseases of the digestive functions.

**Class II.**—Pneumatics: Diseases of the respiratory function.

**Class III.**—Haematics: Diseases of the sanguineous function.

**Class IV.**—Neurotology: Diseases of the nervous function.

**Class V.**—Genitology: Diseases of the sexual function.

**Class VI.**—Eccritica: 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 comprehended by the medical men of that age. The classifications founded on pathological distinctions is that of Pinel, who divides diseases into fevers, inflammations, humours, animal affections, and organic aetiologies. The great objection to this and the like is, that it is building upon the knowledge of the functions of the different parts of the human body, whilst the symptoms of diseases, being very evident, lead to the assumption of causes of disease and pathological states which probably do not exist.

(Cullen, Systema Nematologia Medicinae; William, Principles of Medicine; Mason Good, Study of Medicine.)

**NOSTOC. (Zoocarpus, P.C.)**

NO. 7. 

Notidanus, a genus of fossil fishes from the chalk of Kent. (Agassiz.)

Notidanus, a genus of fossil fishes from the chalk of Kent. (Agassiz.)

WILLIAM, 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' liberty, until King James entertained him to be his attorney.' He was made Attorney-General on 21st 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 jurist, but he was overlooked by his contemporaries. It is probable the knowledge of the law was greater than all other men's by making that law which all other men believed not to be so. It was the characteristic of the great lawyer and jurist that he could not give a clearer testimony that his knowledge in the law was greater than all other men's than by making that law which all other men believed not to be so. It was to his reverence that one of his followers extended the name of superstipendiary to all those who followed his precepts and taught the same spirit, that the court owed the project of ship-money. Dower 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, 1579. In 1577 he published a book on the Antiquities of the Church and the State, in which he endeavoured to show the origin of many of the most important institutions of the Church, and the fact that the Church was the creature of the State. This work was a great success, and was reprinted several times.

The expression subserve as before, prefixed to super, to denote the inverse ratio. The reader may fancy for himself, if he can, the beauty of a treatise in which the ratio of 4 to 11 is expressed by duplus subtripartitae. Not that the writers of these works were ignorant of more simple phrases; and we remember one place in which the example of Aristotle is brought forward to show that it would not be wrong to use them.

Of means, or mediocrities, Boethius discusses ten, to which Jordanus added an eleventh. The first three bear the names which have descended to us, arithmetic, geometric, and harmonic; and all are as follow. Let a, b, c be three numbers, of which a is the greatest and c the least.

1. \( a - b = c \)
2. \( a - b = c \)
3. \( a - b = c \)
4. \( a - b = c \)
5. \( a - b = c \)

The works of Boethius and his followers consist in dissertations on what would now be called the most obvious properties of the ratio of numbers, enriched with comments of every sort from nothing to the theological, and they should be utterly lost sight of, for they form a dark background on which the merits of Sacrobosco, Bradwardine,
NUMERALS, THEORY OF. We are here to supply an omission in the article on this subject, or rather in filling up the references which were made in it.

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 algebraical 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 \( x = \cos \theta + \sqrt{1 - \sin^2 \theta} \), where \( \theta \) is the sub part of four right angles. [Boor, P.C.] Euclid, in his fourth book, shows how to cut a circle into three, four, five, and fifteen equal parts; and analysis shows that the sizes and cosines of the angles so involved can be obtained by formulæ which involve no roots except the square. But except into halves, thirds, fifths, or seventeenths, 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 without demonstration, is instructive to the learner, and we add (accordingly): referring to the solutions of antient equations, and the works of Gauss or Legendre [Numbers, Theory of, p. C.], or to Murphy's 'Theory of Equations.'

The expression \( a \pm \sqrt{b} \), or \( a \) being rational, is the solution of a quadratic equation with rational coefficients. But if \( a \) and \( b \) themselves have the form \( c \pm \sqrt{d} \), in which \( c \) and \( d \) have themselves the same form, and so on; then \( a \pm \sqrt{b} \) is the solution of the equation \( x^2 = 1.0 \), and the division of a circle into \( n \) equal parts, or the \( n \)-th root of \( \sqrt{d} \), 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 quadratic equations, and so on.

Now if \( n \) be a prime number, \( n - 1 \) is an even number, and therefore has factors. Let its prime factors be \( b, b, c, \&c. \), and let them separately enter \( p, q, r, s, \&c. \) times: so that

\[ n - 1 = 2^a \cdot b^2 \cdot c \cdots \]

Gauss succeeded in showing that if \( n \) 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, \( g \) of the fourth degree, \( r \) of the sixth degree, and so on. Consequently, whenever \( 2 \) is the only prime factor of \( n - 1 \), or when \( n - 1 = 2^a \), and \( n \) is prime, or when \( n - 1 = 1 \) is a prime number, the solution of the quadratic equations, and the division of the circle into \( n \) equal parts can be accomplished by Euclid's geometry. And further, it easily demonstrated that \( 2^a - 1 \) can never be a prime number, except when \( p \) itself is a power of \( 2 \) \((2^\text{m})\) included, though \( 2^a - 1 \) is not then always prime. Nor has it been shown that other divisions are impossible: Gauss's theorem merely points out cases in which 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 if we now consider the three \( 2^a + 1, 2^a - 1, \&c. \), among which all our chances lie, we have \( 5, 17, 257, 65537, 4294967297, \&c. \) The first five are prime numbers; Euclid has disposed of the first two divisions; Gauss has added that a circle can be geometrically divided into 17, 257, and 65537 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 this and the preceding, the problem of Euclid, and those of \( \sqrt[3]{3}, \sqrt[5]{2} \), and \( \sqrt{7} \), are solved.

The problem of the quadrature of the circle is not susceptible of such an analytical solution as the problem of finding the root of a quadratic equation. But it is not impossible, by the method of the 'Greece Mathematisches' (1690, vol. i. p. 38) of Deechies, who gives it as the opinion of several of his time. And the earliest hints (by no means complete, and mixed with some absurdities) which we have found are in the 'De Numeris Libri Duo' of John Novomagus, Acts, 30, 8vo.

NUNCAPUTIVE WILL. [Will and Testament, P. C.]

NUPHRAR. [WATER-LILY, P. C.]

NUTRIA. [COTYPUS, P. C.]

NUTTAINIA, a genus of Thelitobites, 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 (Hippoboscides). They have neither wings nor balance. Their intermediate legs are connected at the base by a pair of comb-like organs, instead of the supposed to represent wings. They live on the bodies of bats.

NYMPHAEA. [WATER-LILY, P. C.]

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OATMEAL. [AYER, P. C. S.]

OBLIQUE ARCH. [SEW BRIDGE, P. C.]

OBSIDUENS, JULIUS, the author of a small work in Latin, which appeared in 1779, and was entitled De Præsulis. Nothing is known about the author. Scaliger concludes that Obsidues lived before Hieronymus, because Hieronymus in a particular passage appears to have copied a fact from Obsidues. This passage of Hieronymus was written in the year of 379 A.D. The work of Obsidues 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 Lycosthenes, whose supplement commences with the time of Romulus and extends to the year of 668, when the extant work of Obsidues begins. There are various gaps also in 503, which Lycosthenes has also supplied. The method of the author is to enumerate the wonderful occurrences under any given year, and then state what happened thereon. The following is an example (No. X. 1.):—It rained milk on Mount Grecoastasia. At Croton a calf of sheep with a dog and three shepherds were killed by lightning. At Satura a calf with two heads was born. There was an uproar in the city owing to Gracchus proposing his laws. Obsequens chiefly followed Livy, for he uses pretty nearly Livy's words, as appears from a comparison of Obsidues with those parts of Livy which are extant. His work also terminates with an event relating to Drusus, the son of Tiberius, and he daily of Livy terminates with the death of Drusus.

Lycosthenes in his preface argues that the attention which the Romans paid to wonderful occurrences and signs proved their religious feeling, while their blindness 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 and posterity, who are Christians rather in name than in fact. The divine signs 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 (cometa), 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 impiety 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 famine. The author thought that an edition of Obsequens would be a work of much advantage; and he published a portrait which he had exhibited at 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 for five years of the French government to Rome, but he remained there about eight years. He finally wrote the regulation of the French government, be 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 exhibited 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 1816 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 Obsequens his court painter in the spring of 1816. 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 Galigni, and a picture of Brunante introducing Raphael to Julius II. Obsequens was the commissioner appointed on the part of the Netherlands to reclaim the pictures which had been taken by the French to Paris from the collections of Holland and Belgium. Upon 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 works.

The Battle of Waterloo was followed, in 1820, by the Battle of Nieuwpoort, and a Nascaen, engraved by Vlamynck. In 1821 he exhibited at Brussels his Triumph of Cimabue: and subsequently David 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 altarpieces by Obsequens. He died at Brussels, in February, 1830, 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 1830, have given December 2, 1776, as the date of Obsequens's birth, which is corrected in the fourth volume of appendix, published in 1840, to the date given above. His works have been exhibited in the Royal Academy of Brussels, and in the International Exhibition of Antwerp in 1835, and at the Brussels Exhibition of 1848. His portrait is by Gracchus. The works of Eckhout and Burggraaf, Portraits of the Artistes modernes, etc., Brussels, 1822, and several of his works are engraved in the 'Annales du Salon de Gand'—as the Coronation of Charlemagne; the Confusion of Languages; and the Battle of Nieuwpoort. Some of the pictures of Obsequens 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. (B. Van Eynden en A. Van Der Willigen, Geschiedenis der Nederlandse Schilderkunst, sedert de left van de xvii. Eeuw, Amsterdam, 1842.)

O'DOMETER (from odo, a road, and µέτρον, 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. (Pedometre, in 5th Ed. of Geograph.)

OECCUMENICAL COUNCILS. [Concil of the ChurcH, P. C. S.]

OEDEMERA, a genus of beetles belonging to the third family of heteromeres, head and thorax. (Linn.)

GENOTHERA, a genus of plants belonging to the natural order Onagraceae or Onagraceae. It has 4-eleft calyx, 4 petals, a filiform style, with a clavate or cruciform stigma, linear capsules with 4 valvées, and a tuft of hairs. (Gen. binnisii, Evening Primrose, bas ovato lanceolato flattoothed 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 a tuft of hairs is seen on the base of the flower. It abounds on the Lancashire coast, and covers several acres of ground near Woodbridge, Suffolk. The roots are establie, 311, 2.
and were formerly taken after dinner to flavour wine as olives now are; therefore the generic name was changed from Ougas, the ass-food, to Gugione, the ass's oil. This plant was "noted in the cultivated part of the <as-conf.> for its oil, which in some measure has stood instead of the potato had they not been superseded by the introduction of the latter. This is the only British species of the genus. There are 85 species, monoecious, found in Europe. Oggione is a branch of the same family. 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 perennial soil, and may be increased by seed, by dividing the plants at the root, and some of them. The seeds of the annual and biennial kinds only require to be sown where the plants are intended to remain.

(D'Orchard's Dictionary; Babington, Manual of British Botany; Burnett, Outlines of Botany.)

OFFERINGS, OBLATIONS, AND OBLIGATIONS are not only those small customary sums paid at Easter, but also the customary payments for marriages, churchings, christenings, 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 parson, vicar, proprier, 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 within the space of four years hereafter shall be used and accustomed for the payment of the same; and, in default thereof, to pay for the said offerings at Easter next following. The four offering-days above spoken of were Christmas, Easter, Whitsun-tide, and the festival of the dedication of the church. It is directed by the rubric, at the end of the Communion Service, that 'in the morning every one that at this offering shall be excused to commune at the Table of Christ, and to the parson, vicar, proprier, and 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 within the space of four years hereafter shall be used and accustomed for the payment of the same; and, in default thereof, to pay for the said offerings at Easter next following.' The four offering-days above spoken of were Christmas, Easter, Whitsun-tide, and the festival of the dedication of the church. It is directed by the rubric, at the end of the Communion Service, that 'in the morning every one that at this offering shall be excused to commune at the Table of Christ, and to the parson, vicar, proprier, and 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 within the space of four years hereafter shall be used and accustomed for the payment of the same; and, in default thereof, to pay for the said offerings at Easter next following.'

Surplus-fees are payable for every marriage, whether by banns or by licence; and for every funeral, churching, or christening, 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 1s.

(Bill's Sociologia.)

OGGIONE or OGGIONE, MARCO DA, a Milanese painter and distinguished scholar of Leonardo da Vinci at Milan about 1490; he was born therefore about 1470, at Oggione, in his native district. He painted in oil and in 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 by Lanzi, are now in the possession of Baron Baber of Milan; they were removed from the church by Barabazi. 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 paints by oil 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 valuable. The opinions regarding its merits are various. Giuseppe Bezzuoli kindly approved of it; but as the original has been virtually decayed since 1726, when it was first restored, all subsequent judgments of the merit of the copy with respect to the original must be received with due reservation, as they are not the result of individual fancies of what the original contains. The remains of the original are on the other hand the basis of all critical speculations of 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, from a small copy made by himself. One is in the Royal Academy, and one in fresco for the Refectory of the convent of Castelazzo, which was copied by the Cav. Giuseppe Bosi, though not finished. Bosi's picture was taken chiefly from a copy in the Ambrosian Library made by Andrea Fontoni called Vulpio in 1819, when the original was already much decayed. There is another copy by Francesco Capriani, made in 1565, and attributed to Pietro Luini. Bosi'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 executed 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 the size and composition; and to the true lover of art can have little value, compared with the old unassuming copy of Oggione. The mere fact that Oggione's copy was painted for people who had not seen the original, and by a distinguished pupil of Leonardo's from the original when in its perfect state, ought to be sufficient guarantee for its fidelity, notwithstanding its imperfections, making of course due allowance for the different capacities of the two men. Marco da Oggione died in 1590.

(Lanzi, Storia Pittorica, &c.; Götze, Propylaen.)

OHMACHT, LANDELIN, an eminent German sculptor, was born at Donningen near Rottweil in Württemberg, in 1760. He was the pupil of J. P. Moltchier. His first public works were some sculptures for the Kreuzkirche at Rottweil, which still decorate the choir. He executed the following other works in Strassburg: 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, the first of which was the monumental statue of the cathedral of Lübeck; but his principal works are at Strassburg, where he settled in 1801. His first work there was the monument of General Desaix, who was killed at Marengo, erected on the spot near Strassburg where there are four monuments also by him in the church of St. 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 also a monument in the church of Dr. Blessing; another to General Kleber, in the cathedral; and a colossal figure to Adolph von Nassau, in the cathedral of Speyer. There are several classical figures by Ohmacht—such as Apollo, Minerva, Mars, &c., in the Judgment of Paris (at Nymphenburg), and others. Among his busts are several of Klopstock, with whom he was intimate. He died at Strassburg, 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 Strassburg, is reported to have said that one could not sufficiently admire them, and that Ohmacht was the Correggio of sculptors.

(Nat. Alleman. Kunstler-Lexicon.)

OIL-PAINTING. (Etex, John Van, P. C., p. 138; Painting, P. C., p. 142.)

OILS, BRUSHWOODS OF. (Painting, House, P. C., p. 145; Staining, P. C., p. 479.)

OILS, MANUFACTURE OF. An account of the properties of the more important oils, and of the materials from which they are employed, is given in P. C., pp. 410, 411. Oils, Vegetables, P. C., p. 417; and further information may be found under the names of some of the principal oils, as Croton Oil, Linseed Oil, and Oylve Oil, or in articles which treat on the materials from which oils are made, such as Elmi, Madia, Linseed, Oyle Europ., Ricinus Communis, and Guajacho Blu. Under Fisheries, also (P. C., pp. 288, 289), is given much information on the produce 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 Oyle and Fisheries above referred to. The blubber, or fat from which the oil is procured, 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-putrifying condition, and is emptied into some vessel 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 matter of the blubber is completed by the action of heat. From the boiler the oil flows through a kind of filter of brushwood, which detains the grosser impurities, into coolers, from which, when quite cold, it may be drawn into large barrels. Various processes are employed for purifying whale oil and diminishing its unpleasant smell. The quantity of oil obtained is about four-fifths that
OIL

OIL

The blubber used in the South-Sea fishery is it found advisable to separate the solid residue, by boiling in hermetically sealed vessels, and so 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 pressed between two rollers; but 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 obviate 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. Herbold, in 'the Engineer's and Mechanic's Encyclopedia,' vol. ii. pp. 172, describes an apparatus of this kind, in which the blubber-scrapes are put into a hollow cylinder, 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 the blubber is laid a mattress of wicker-work, to prevent the blubber from chocking up the holes. This press is the invention of Mr. John Blythe, of Limehouse.

Olives, as explained under Olea Europaea, in P. C., differ from most vegetable expressed 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 no machinery; but writers differ in their accounts of the process, in some important particulars; some stating that the fruit should be gathered a little before it is ripe, and spread on the floor of a roofed court, or in a room; while others place the volume on 'Vegetable Substances used as Materials of Manufacture,' in the 'Library of Discoveries in Knowledge,' it is stated upon the authority of an English gentleman who had resided at Gallipoli, where much excellent olive oil is made, that the Gallipolitans 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. i. p. 78), in an account of 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 imparting an earthly 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 authority, 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 cellars, with ample ventilation, in order to facilitate the extraction of their oil. 'If,' he adds, 'this practice were really prejudicial to the produce, as some theorists have said, would not the high reputation and price of olive oil in the market be due to the habit of the French in inducing them to change their system of working?' In fact, he proceeds, 'all depends on the degree of fermentation excited: they must not be allowed to mould in damp places, to lie in heaps, or to be charged with reddish liquor, or to become so hot as to raise a thermometer plunged into the mass up to 86° F. . . . A slight fermentation, however, is useful towards separating the oil from the mucilage. The first and finest oil is obtained by crushing the olives in a kind of mill, termed by Dr. Ure an edge-mill, in which the crushing-stones are so mounted as not to break the stones of the fruit, but simply to crush the pulp. The mass thus bruised is put into coals, or bags made of haircloth, or of coarse canvas, which are piled or laid upon one another to the number of eighteen, and exposed to gradual compression in a screw-press; and the oil which flows from the coals, which is the pure virgin oil, is conducted by channels into casks or stone cisterns partly filled with water, on the surface of which it floats so that it may be readily collected by skimming. When the oil ceases to flow, the mass of pulp is taken out of the bags, mixed with boiling water, and treated as before, but with an increase of pressure. The second quality of oil thus procured is quite fit for table use when fresh, but is apt to become rancid by keeping. After skimming, when cold, the subjacent water still retains a good deal of oil, by the intervention of the mucilage; but after long repose in a large cistern the oil and water separate, and the water may be drawn off. Owing to the nature of the process, the oil is very liable to deteriorate in quality, and can only be used for factory purposes. A still coarser kind of oil is finally procured by crushing the marc, or solid residue, which is pressed out of the stone vessels and brought home in the same manner, and then mixed with water, and re-pressing it. All the oil, Dr. Ure observes, must be fixed by keeping in clean tuns, in an apartment heated to at least 60° F., for twenty days, after which it is run off into strong casks, cooled in a collar, and then sent into the market.

Dr. Ure, in the article and page above referred to, gives the following useful directions for refining olive-oil for the use of watch-makers:—'Into a bottle or phial containing the oil, a slip of sheet-lead is immersed, and the bottle is placed at a window, where it may receive the rays of the sun. The oil by degrees gets covered with a curdy mass, which, by being pressed from the bottom of the phial, gives it a limp and colourless. As soon as the lead ceases to separate any more of that white substance, the oil is decanted into another phial for use.

Passing over the processes of manufacture of many kinds of oil of less importance, we proceed to take linseed-oil, or the oil extracted from the seeds of the flax-plant, as an illustration of the manufacture of oil from seeds. 'Linseed, rape-seed, poppy-seeds, and other oleiferous seeds were,' Dr. Ure observes, 'formerly treated for the extraction of their oil, by pounding in hard wooden mortars with pestles shod with iron, set in motion by cams driven by a shaft turned with horse or water-power; and the pressed-out oil was collected in bags, which were wrapped up in hair-cloths, and squeezed between upright wedges in press-boxes, by the impulsion of vertical rams driven also by a cam mechanism. In the best and most approved of these flax-mills, near Newcastle-upon-Tyne, is given in Dodd's 'British Manufactures; Chemical,' (forming No. xiv. of 'Knight's Weekly Volume,' and in No. 802 of the 'Penny Magazine,' where also are some interesting details respecting the mode of cultivating and preparing hemp-seed and rape-seed for oil-manufacture. When flax is cultivated for its seed, the plants, after being pulled up, are either laid on the ground in handfuls, with the seed end towards the south, or else several plants are tied together at the top, and placed upright with their roots spread out. When they have been thus dried by exposure to the air, the seeds are separated from them by means of large ripes, or coarse teeth. When the flax is grown as an industrial plant, the seeds are removed, and by which the capsules containing the seed are separated from the flax. [Flax, P. C., pp. 303, 304.] The seeds and pods are then spread thinly upon a platform, and the wind by means of a current of air causes these pods of themselves, while such as are less ripe will need to be lightly trodden or thrashed. The whole is then carefully sifted, winnowed, and cleaned from dirt and chaff.

As the hard seed of this plant, or rough flax-seed, has a tendency to slide away unbroken under the ruffling action of the millstones by which they are ground, it is well, before taking it to the grinding-mill, to bruise or crush it by causing it to fall from a hopper between two iron crushing-rollers, placed side by side, and capable of being pressed against each other with any determinate degree of force; but the use of such rollers is by no means universal, the seeds being, in many cases, submitted to the grinding-mill without any such preparation. This mill, which is sometimes called an edge-mill, consists of a pair of stones, technically called running-stones, or rollers, usually made of granite, resembling grindstones in shape, and from five to seven feet in diameter, so mounted as to roll round in a circular path of small diameter upon a solid horizontal bed of stone or iron laid beneath them. These stones, which roll the bed from thirty to thirty-six times in a minute, are sometimes hooped with iron, though many prefer the rough surface of the granite, which may be re-dressed with a hammer as often as is needful. They grind the seed partly by their weight, which often amounts to three quarters of a ton each, and partly by their motion, the friction arising from the circumstance that the outer edge of the stone has to perform a larger circular path than the inner, although the two must of course revolve round the axle at one and the same speed. The seeds are thus very intimately ground, so that the grit is forced to roll onward in a straight path. The two running—
stoned are mounted on the same horizontal axis, but at rather different distances from the central vertical shaft or axle 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. In some instances a frame is fixed with the running stones, which are mounted carriers also in two racks 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 expression of the oil, to a pulp, from which a limited quantity of very fine cold-pressed oil may be obtained by the simple action of the press.

Owing to the extreme hardness and smoothness of the seeds, and to 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 press 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 sudden impulses or blows upon the end of a wedge, than by the gradually and gradually increasing pressure of 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, and these bags are then placed between the arms of a wedge, so arranged that they are pressed by means of wads 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 the 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—615) is an important information on the subject, states that the driving of the wedges is continued until they are so tight that the pestle rebounds from them three times, when they are judged to be sufficiently driven. 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 put as woolen, 'unfolded (unfolded?) by horse-hair mattresses, enclosed in leather wrappers.' The last-mentioned writer states that the first oil-mill in which the hydraulic press was thus employed was built at Bremen, in 1851, and that its proprietor was satisfied with the superiority of the plan to any other then in use. Among other advantages it is stated that the hydraulic or hydrostatic press requires less space, and that in some cases, besides the oil and cake, no other by-products are obtained. The cake, and 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 1833 an ingenious oil-press in which the power of a steam-engine or other prime mover was to be applied through the medium of cause or fanlematic rollers: but Barlow states that the plan has not been generally adopted.

We have hitherto spoken only of the extraction of the fat matter by means of heat before the cold pressing is bowever 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 manufactures. The different processes for the extraction of the oil-cake, 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 cold water. 'Fingers, hands, and the pestles and the paste again broken down, and the parenchyma of the seed reduced to a fine meal; thus free egress is allowed to the oil from every vesicle in which it is contained, but it is now rendered more efficient by the addition of a few drops of rottenstone and even of the fine parts of the meal. When sufficiently heated it is removed to a chaffeur, or circular copper-pan, in which, while it is kept continually stirred by machinery, it is heated to about the temperature of melting bees-wax, 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 a third time. The last oil-cake, which is of inferior quality, is produced. Sometimes the produce of oil is increased by mixing a little water with the paste; but this practice is considered to impair the quality of the oil. The oil-cake is also often used as food for cattle, and for various other agricultural purposes; but of course they vary greatly in richness according to the degree in which they have been divested of oil. Barlow states, indeed, that they 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 seed, and exposes it to the risk of fermentation." Moreover, the bran or布朗 which is thrown off as a by-product of the process of grinding may be facilitated by the addition of a little water. The oil produced by the above process need not further attention. If left in a cistern, as it is by the Dutch manufacturers, the oil, which is at first relatively passes away with the oil in some degree in the operation of pressing, will gradually subside, and the oil may be drawn off at various levels, of different degrees of purity; the bottom being at length removed to a deep and narrow container 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 succulent oil, it is slow in drying, and as this is a great inconvenience for 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. Urey's Dictionary of Arts, and in Supplement to that work; and some ingenious processes of simpler character are described in Hébert's "Engineer's and Mechanic's Encyclopaedia;" and in both of these works additional details may be found of the machines for second pressings, and other generally important character. The process of making castor oil is detailed under Ricinus communis, P. C., p. 5, 6.

O'KEEFFE, JOHN, was born at Dublin, on the 24th of June, 1747, the eldest son of Mr. Hugh O'Keefe, a stonemason, who died when only six years old, under the charge of Mr. West at the Royal Irish Academv; 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 Bossow, at the Smock-alley Theatre in Dublin. His dramatic turn now took entire possession of him. He obtained for engagement in the Smock-alley Theatre, one of the chief companies, a footman's place, and on other parts which he held 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 comedies, farces, and ballads. In the year 1764 he married a daughter of Mr. Heaney, proprietor of the Theatre Royal in Dublin, by whom he had three children. Domestic disagreements arose: after seven years of union Mr. O'Keefe deserted his wife, and the marriage was annulled; and the separation lasted for the remainder of their lives.

In 1778 Mr. Colman brought out successfully, at the Hay-market, the farce of 'Tony Lumpkin in Town,' the first Irish drama that was properly acted. In the year 1781, 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 pieces were composed for Colombia at the Haymarket and, Weimar and under the management of Harris. His dramatic career may be said to have closed in 1788, after which date no new play of his was brought upon the stage. The fruit of his labours was the local length of the annuity, 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 the stage. Such are his comedy of Wild Oak, and his operatic facies of The Agreeable Surprises and The Highland Reel.

O'Keeffe's works do not belong to a high class. Their diction is coarse, and in incident and character they are merely farcical. Nor did O'Keeffe but the planet, few but the bat, ought 1801, for three but those 1830, to the 1798, and, added 1768, to the 1799, to the 1802, and, added 1779, 1781 and 1776; those of two comets which appeared in each of the years 1798 and 1799, of one in 1802 and of the great comet of 1811.

The interval between the orbits of Mars and Jupiter, which appears disproportionately great when compared with the intervals between any two of the other planets belonging to our system, had suggested to the original and inquisitive mind of Kepler the idea that the 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 last, that region, and of Jupiter, 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 securing, 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, the Baron Zach secretary; and among the members was Dr. Olbers: the latter, who conceived the association immediately rewarded; and M. Piazzi, of Palermo, who was not one of the number, had the good fortune to discover January 1, 1801, a planet, to which he gave the name of Ceres, and which was afterwards, by Dr. Olbers 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.

This planet soon afterwards became invisible, from its vicinity to the sun; but Dr. Olbers 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. Olbers, being engaged in examining the northern part of the constellation Virgo, discovered a star which was not in any of the catalogues of stars. The accidental discovery, however, was 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 position in the sky, and from the same part of the ecliptic, to have a third planet at a distance from the earth which is almost equal to that of the planet discovered by Bode, whither the conjunctions of 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 that it has been broken up. Par-
He noticed the comet like he had noticed Juno, has the nodes of its orbit near those of Pallas. Ogilvie and Bessel computed the eccentricities of the two planets are 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 a particular object of research; and, from 1804 to 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 other planets. On the 3rd of April, in 1807, his sagacity and diligence were rewarded by the discovery of a fourth planet: on the 2nd of August he made 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 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 confirmations of the opinion of Olbers have been afforded by the discovery of a planet Vesta, in the month of October, 1845, by M. Hencke of Drisen, 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 Pegasus, a comet which presented the appearance of an attenuated nebulous without any visible nucleus; and he continued to observe it till the end of August, when it ceased to be visible; its orbit was calculated by Bessel 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 a comet may come in collision with the Earth—a subject which then engrossed the attention of astronomers on account of the near approach of the comet Biela when one part of its orbit. In 1841 he made a proposal for a re-formation 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 in 1804, and a Foreign Associate of the Académie des Sciences at Paris in 1822; 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 Bremen on the 2nd of March, 1840; and, as a proof of the esteem in which he was held, the inhabitants of Bremen placed his bust in the public library of the city.


OLDIXON, JOHN, one of the heroes of the Duscid, 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 thoroughly unacquainted: and his principal productions were historical, political, and critical. He superintended, 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.' The two latter volumes are chiefly remarkable for their strong spirit of Whig partisanship. In criticism Oldixon was distinguished for his unscrupulous abuse of Pope and other eminent men of his day. He found abundance of material in the present, not only in contributions to periodical prints, 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 in the place of Collector-general at the port of Bridgewater. He died in London, in 1742.

OMBROMETER. [Rain Gauge, P. C.] OMNIBUS. [Metropolitan Stage Carriage, P. C.] ONGA. (Ghana) was founded in the Sudan in 1924 at the entrance of a river of the same name, 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 prices of these stocks in which a loan is desired, as the prices at which they bore on that day, and the fund thus formed as an average of the whole is called Ongam. (McCuiloch's Dict. of Commerce.)

ONGAR. [Essex, P. C. S.] ONGATAS ('Owron's) of Asine, the son of Micon, was alike distinguished as a painter and a sculptor; he was contemporary with Polygnotus, and lived according to the early historians, about the year 1800 B.C., and about the year 1700 of 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, a native of the place, who bore the name inscribed upon it, and who speaks in terms of great praise. Pausanias speaks a group of Homeric heroes near the great temple at Olympia, which were dedicated by the Achaeans in common; Thersites attributes them all to Onatas, the son of Onatas, or his name is inscribed on one only. Pausanias says that the Achaeans in common dedicated those statues which represent the Greeks who drew lots for the challenge of Hector; they stood armed with spear and shield 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, had been removed by Nero to Bone. Of the remaining eight, five were dedicated by the Athenians, three by the Corinthians, and the seventh by Teutons, in terms of great praise. Pausanias speaks of a group of Homeric heroes near the great temple at Olympia, which were dedicated by the Achaeans in common; Thersites attributes them all to Onatas, but his name is inscribed on one only.

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 Callicteles, whom Pausanias supposed 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 in a picture or wooden image, in the same way, assisted by a vision in a dream: it had a horse's head. He made also a statue of Apollo, at Pergamus, magnificent for its size and its workmanship.

Onatas, the bronze charioteer of Hero, dedicated by his son Deinomenes at Olympia in honour of his father's victories in the games: the horses and riders were by Callimachus. He made also, together with Calythus, an artist otherwise unknown, the monument dedicated by the 'Darellines 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 Danaeans, 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 Crisansea 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 first experiment of Titivages against Thersites. He probably also painted at Plataea the picture of Eurymas lamenting the death of her sons Eteocles and Polyneices killed by each other's hands; which, according to Sibylsburg, is by a MS. error, attributed to the other Greek artist, Ctesias, who bears the name. Thersites supposes Micon the father of Onatas to be the celebrated Athenian painter of that name.

(Pausanias, v. 26, 27, vili. 42, vi. 12, x. 18, ir. 5; Junius, the Lives of the Ancient Poets, to Thersites, Elegies der Bildenden Kunst unter den Griechen; Böttiger, Ideen zur Archäologie der Malerei.)
ONGOLE, or ANGOLE, a town of Hindustan, in the Presidency of Madras, and Northern Carnatic. [Carnatic, P. C. S.] Ongole is the chief town of the district of Ongole, and 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 1815, but remained, with a few exceptions, unpossessed until 1853, when it was ceded by the native chiefs to the British. The town was then strongly fortified, but the fortifications have been suffered to fall into decay or have been destroyed.

(Atlas's "East India Gazetteer.")

ONGOHICHS (from *iwer, an ass, and *Dphw, to grasp the teeth), a genus of plants belonging to the natural order Leguminosae. It has a calyx with five nearly equal subulate teeth, a keel with uniformly truncate, longer than the wider, the pod one-seelled, compressed, indehiscent, one-seeded, upward straight, lower curved, toothed, winged or crested. The species of this genus are natives of Europe or Asia, with unequaly pinnate leaves, and axillary elongated peduncles having spines of flowers red or white at their tops. The most common, as well as only British species is *Onogorhics section, common Sainfinum. [Sainfin, P. C. S.; Hedstram, 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.

(Don's Gardener's Dictionary; Babington's Manual of British Botany.)

ONIONS (from *iwer, an ass, and *Dphw, to delight, of some the species being said to be grateful to ass's mouth), a genus of plants belonging to the natural order Hyacinthaceae. It is a herbaceous, annual, cleft campanulate calyx, narrow segments, the lower ones longer. The keel is beaked, the style filiform and ascending, the stigmas terminal and subcapitate.

(Don's Gardener's Dictionary; Babington's Manual of British Botany.)

O. anomala, growing in the opposite direction has a peculiar unifo rmly hairy stem, axillary stalked solitary flowers, broadly oblong leaves, ovate pods shorter than the calyx. It is usually without spines. The stems root at their base, and the seeds are tubercular and smooth in the plants.

(Don's Gardener's Dictionary; Babington's Manual of British Botany.)

O. arietis, a viscid pubescent stem, axillary flowers with one flowered pedicles shorter than the leaf flower, a pod without bracts, the corolla about equal to the calyx, obviate cuneate leaves serrated at the lip, ovate stipples, and cylindrical reflexed pods. It is found in sandy places in Galloway and on 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 of Europe and Asia. All are annuals and a few on the coast of Asia. They are generally hand some 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.

(Don's Gardener's Dictionary; Babington's Manual of British Botany.)

ONGORDUM, a genus of plants belonging to the natural order Compositae. It has a honeycombed receptacle, a four ribbed fruit, and an imbricated involucre, with simple spinous pointed scales.

O. Acanthium, Cotton-Thistle, has an erect many-headed, elliptic-oblong leaves, woolly on both sides; serrate, spinous, and decurrent; the outer involucral scales lanceolate, subulate, recurved, and spreading. The stem is from four to five feet high, and has a short yellowish-green stem. The involu cre nearly globose, large, and somewhat cotonny; the scales fringed with spinous teeth; the florets are purple. This plant is found on waste ground in Great Britain and Spain, and another name for the same species is Wild Artichoke, or Alacacheta of the Spanish, on account of the flaky receptacle being once cultivated as an esculent vegetable. The expressed juice of this plant is said by Eller to be a serviceable medicine in the case of the breast, and to cleanse foul ulcers; and a decoction of the root, which is sanguineous, has been used to restrain discharges from the nervous member. The species of this genus have been examined 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.

(Babington's "Manual of British Botany")

ONOSMA (from *iwer, an ass, and *moua, smell; grateful to the ass), a genus of plants belonging to the natural order Boraginaceae. It has a five-parted calyx, a tubular campanulate corolla, and a naked throat. The anthers are siliate, 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 bases. The species are found in the United States, in woods, with crowded lanceolate or linear leaves, and terminal racemes of large yellow several and usually drooping flowers.

O. Emoidi has lanceolate tridented leaves, lesser hairy beneath, terminal solitary racemes, linear bracts, not half so long as the flowers; the calyx is five cornered with ovate segments, a verticose five-keeled corolla contracted towards the mouth, and the anthers longer than the filaments. It is native of Nepal, in Gosaingsthan, where it is called by the natives Mahomrav. The root is bronched, of a dark purple colour, and is used in dyeing.

O. echinatum is a huisp plant, covered with white punctate hairs. It is tropical and annual or biennial flowers. The corolla is yellow, a little longer than the calyx, tubularly campanulate with reflexed teeth.

O. innotorium is native of Tauria, in the vicinity of the Black Sea. The species is very hairy, the flowers are 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 poor and small soil in other plants.

(Sturm, Lexicon; Hassel, Handbuch; Cannich, Lehrbuch.)

OPACITY is a condition of bodies 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 some, opacity may arise from the unequal densities of the particles of certain substances, in consequence of which the rays of light on entering those substances suffer such refractions and refractions as compel them there to reflect. It may be far further to be due to a density of the Atmospheric medium, in bodies 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 refractions 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 must 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. [Transparrent, P. C. S.; Absorption of Light, P. C. S.]

OPERATION. This term we intend to point out the principal steps of the application of the calculus of operations [Operation, P. C.] to the solution of differential equations and equations of differences. This point must be carefully read before the present one, and also the general principles laid down in Algebra, P. C. S.

However much the calculus of operations may throw light upon the character and principles of algebra, application of it to the

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time have been thought unlikely that it should much facilitate actual processes. It does this, nevertheless, and no where more than in the subject we are now going to describe.

Solutions which by the usual method (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 arising, and $D$ for the direction to take the differential coefficient with respect to $x$, we have no right to say $$E\phi(x) = \phi(E(x)),$$ or $$D\phi(x) = \phi(D(x))$$ or $$D\phi (x) = \phi(D(x))$$ in which $\phi$ is the function operated upon. But we thus use another function, $D\phi$, beside the one operated on, $\phi$, this convertibility of operations is the only rule of algebra which falls; it is therefore the only one the use of which we must avoid.

The operations $E$, $\Delta$, and $D$ are closely connected with $E+\Delta+a$, $D+a$, of which they are particular cases; $a$ being a constant, positive, negative, or nothing. We have

$$E^{(a)} \phi(x) = a \phi(x+a),$$

$$(\Delta-a) \phi(x) = a \phi(a+\Delta(x)-\phi(x))$$

The first sides of these equations being representatives of $\phi(x+a)$ and $\phi(x)$, $E^{(a)} \phi(x)$ and $\Delta-a \phi(x)$, and $a \phi(x)$. If these operations be repeated, we have

$$E^{(a)} \phi(x) = a \phi(x+a),$$

$$(\Delta-a) \phi(x) = a \phi(a+\Delta(x)-\phi(x))$$

$$(\Delta-a) \phi(x) = a \phi(x+a)$$

These results will also be found to be true when $m$ is negative, by which means we are enabled to interpret $(\Delta-a)^{-1}$, $(\Delta-a)^{-1}$, and $(\Delta-a)$ 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 $D_x, D_y, D_x, D_y$ be similarly interpreted with respect to the differentiations and differences.

We have then

$$E_x - a \phi(x) = (a+1)^{e^x} \Delta_x^a \phi(x)$$

$$(\Delta-a)(x) = (a^1)^{e^x} \Delta_x^a \phi(x)$$

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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 $a$ or $b$ may be symbols of operation, but not with respect to $x$ or $y$. Thus

$$(D_a - a \phi(x) = e^{x b} E_a \phi(x) = e^{x b} \phi(x)$$

$$(D_a - a \phi(x) = e^{x b} E_a \phi(x) = e^{x b} \phi(x)$$

$$(D_a - a \phi(x) = e^{x b} E_a \phi(x) = e^{x b} \phi(x)$$

in which the second side is to be thus interpreted. Changing $y$ in place of $x$, differentiate as many times with respect to $x$, and then change $x$ into $y+1$. We shall now give 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—

$$\frac{dy}{dx} + b \frac{dy}{dx} + c = 0$$

in which $a$ and $b$ are constants, and $x$ a function of $x$. The operation performed upon $y$ is $a \phi(x) + b \phi(x) + c$; if this is called $G$, then $y$ is the result of performing the inverse operation $G^{-1}$ upon $x$. By the method explained in Fractions, Decomposition of, P. C. S., transform $(a\phi(x) + b \phi(x) + c)^{-1}$ into $A(D-a)^{-1} + B(D-b)^{-1}$, &c., where $a, b, \phi(x)$ are the roots of the algebraical equation $a^2 - b^2 = 0$. Then is

$$A(D-a)^{-1} X + B(D-b)^{-1} X + c$$

or $A(a)^{-1} \phi(x) X + B(b)^{-1} \phi(x) X + c$, substituting for $D$ 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

$$e^{x.a} = 1 + e^{x.b} = 0$$

the second term of which is $e^{x.\phi(x)} + e^{x.\phi(x)}$, $P$, $Q$, 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

$$K(D-a)^{-1} X + L(D-a)^{-1} M(D-a)^{-1}$$

which contribute to the general value of $y$.

$$K(D-a)^{-1} X + L(D-a)^{-1} M(D-a)^{-1}$$

and the arbitrary part $e^{x.(P+Q+R)}$, $P$, $Q$, and $R$ being any constants.

Every single root $a$, contributes to the solution a term of the form

$$A(D-a)^{-1} X$$

in which $D-a X$ may be any function of which the difference is $a X$. If $a$ be an integer, what is called $X(a^2 X)$ will do. Any set of equal roots contributes terms of the form

$$A(D-a)^{-1} X$$

Any linear equation being given, in which either of the operations $E_x, D_y$, or $D_x$ is combined with either $E_y, D_y$, or $D_x$, the form of the solution may be found. Take for example

$$\frac{dy}{dx} + a \phi(x) + b \phi(x) = X$$

the operation performed upon $\phi(x)$ on the first side is $D_y - E_y$ and accordingly we have

$$w_x \phi(x) = e^{x b} \phi(x)$$

which is one form of the solution, and must be interpreted by expanding

$$e^{x b} \phi(x) = e^{x b} \phi(x)$$

Another form can be obtained from

$$E_y - D_y w_x \phi(x) = 0$$

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 Library of Useful Knowledge, in the 'Treatise on the Differential Calculus,' pp. 753-758.

The theorems answering to that of integration by parts, when $D$ and $E$ are used, are as follows. To save room let $D$ and $E$ be denoted by $\alpha$ and $\beta$. Then

$$e^{\alpha} (P\phi(x)) = e^{\beta} Q e^{\alpha} (P\phi(x))$$

$$e^{\alpha} (P\phi(x)) = e^{\beta} Q e^{\alpha} (P\phi(x))$$

$P$ and $Q$ being functions of $x$, to which $D$ and $E$ refer, and $P$ meaning $d^2 P/dx^2$. When $a=0$, the first becomes

$$\int P\phi(x) = \int P\phi(x)$$

which is the formula for integration by parts. And if $Q$ be of the form $Q \phi(x)$, or $Q \phi(x)$, and $P$ be a rational and integral function of a lower degree than the $w$, the preceding opera-
O.P.H

The obscure genus *R. elongated, Adder's genus

By help of these theorems the intermediate equations of any linear equation can be readily discovered. Suppose, for instance, we have

\[ (D-1)^2(D-2) y = x, \]

an equation of the eighth degree. There are eight of the seventh degree. Two of them are discovered at once by performing the operations \((D-1)^2\) and \((D-2)^2\) on both sides, giving

\[ (D-1)^2(D-2)^2 y = x^2, \]

\[ (D-1)^2(D-2)^2 y = x^2, \]

To find the other six, multiply separately by \(x, x^2, x^3, x^4\), the simplest of their several determinants, perform \((D-1)^2\) upon all four results, and \((D-2)^2\) upon the first two. This, by the preceding theorems, can be done.

Thus, multiplying by \(x\) we have

\[ (D-1)^2(D-2)^2 y = x^3, \]

\[ (D-2)^2(D-1)^2 y = x^3, \]

which are two more of the required equations. To find the equations of the sixth degree, those of the seventh degree must be selected which admit of a repetition of the operation, without leaving the inverse form \((D-2)^2\) or \((D-1)^2\) 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 very interesting extensions to the subject.)

O.P.HYDRIUM (from φυρα, a snake, and γυναικα, the tongue), a genus of malacopterous fishes of the Ela tribe. The species have smooth heads; long slender bodies, margined by the united dorsal, 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 filamentous appendages or bars attached to the tail. They are distributed in the north and south poles, but both very rare. In the Mediterranean, the bearded ophidium is common, and is used for food.

O.P.HYXALEUS (from φυρα, a snake, and γυναικα, the tongue), a genus of fishes belonging to the division of Acant. thepsergii, characterised by having labyrinthine pharynxes, and capable of living for a long time out of the water. The species inhabit India and China. [ANABAS, P. C. S.]

O.P.HIOGLOSSUM (from φυρα, a snake, and γυναικα, the tongue), a genus of plants belonging to the natural order Filices and the tribe Ophioglossine. The theeae are comate, disposed in a simple distichous spike attached to an undivided frond.

O. vulgatum, Adder's Tongue, is the only British species. It has an ovate obtuse 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. Ray recommends it as an elixir redissolved in oil and adder's-tongue. Gerardi says that the Adder's Tongue is dry in the third degree. The leaves of Adder's Tongue stamped in stone mortar and boiled in olive oil into the consumption of the juice and until the herbs be dry and perished, and then strained, will yield a most excellent green oyle 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 an ointment of the green leaves, and use it as a vulnerary. It is also used in the same way in many parts of England.

(NEWMAN, BRITISH FAUNS; BABINGTON, Manual of British Botany.)

O.P.HIOXYLON (from φυρα, a serpent, and οξύς, 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 funnel-shaped corolla with a long tube, thickest in the middle, and a 5-cleft oblique limb. The authors are subestinate. The tube is inserted into the middle of the ovary is double, each lobe with one ovule, a bilabium enclosed style and a capitulate 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. serpentinum, Serpentine Snake-Wood, is native of the East-Indies. In rich soil it becomes a climbing plant, but in poor soil it is a small creak shrub. The leaves are in threes or five; 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 corollas white. In India the root of this plant is employed by the 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 dropped into the eye for the same purpose, and it is likewise used to remove tophi and ulcers of the face and 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 will readily strike root under a glass in heat.

(Don, Gardener's Dictionary; Lindley, Flora Medica; Burnett, Outlines of Botany.)

O.P.HYSIS, a genus of plants belonging to the natural order Orchideae. It has a patent perianth, a variously-lobed lip without a spur, and the glands of the stalks of the pollen masses each in a distinct pouch.

O. opifera, Bee Orchis, has a tumid 5-lobed lip, the two lower lobes prominent and with a hairy base, the two intermediate reflexed, truncate, terminal, acute, elongated and reflexed; the anchors with a hooked point, the petals oblong, bluntish, downy. It is about a foot high, and has large, few, and rather distant flowers. The sepals are whitish edged with purple. The lip is velutiny, brown, variegated with yellow. It is one of the handsomest species of orchideaceous plants, native of Great Britain, and grows on chalky calcareous soils.

O. aractomites, late Spider Orchis, is distinguished by a terminal, inflexed, flat, rather heart-shaped appendage, and deltoid downy petals. The sepals are pink, the lip dark purple variegated with yellow and vellow, the appendage green, never reflexed. It is found on chalk downs near Folkstone and Sitlington in Kent.

O. transitoria, Spider Orchis, has 3 obaceous lobes, the middle lobe large, emarginate, without an appendage, the petals linear and hairy. This nectore 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. nauseifera, Fly Orchis, has an oblong trifid lip with a large pale spot in the centre, the middle lobe is elongated, bialid, the anchors 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 a bluish tinge. It is found in damp calcareous thickets and pastures in Great Britain.

(BABINGTON, Manual of British Botany.)

O.P. ORINIA, a genus of plants belonging to the natural order Compositae. It has a subular capitulum with a posterior scale much smaller in several rows, a penetrate receptacle, attenuated uniform fruit: the pappus of all the fruit in one row, festished, dilated at the base.

O. actuina, Tellus-leaved, linear, lanceolate, toothed, or pinnafilate, nearly glabrous; stalk branched, scaly, and thickened upwards, the involucrum glabrous or hairy. This is the *Aptopia actuina* of Smith, and the *Leontodon actuina* of Koch. It is a very great Brittan in meadows and pastures and on rocky mountains.

(BABINGTON, Manual of British Botany.)
OPT

OPONAX, a genus of plants belonging to the natural order Umbelliferae; it has an obsolete calyx, roundish entire petals rolled inwards, with a rather acute lobe; compressed ovate obovate segments, and bipyramidal less common with unequally cordate segments, created and obtuse. The umbels are compound; the involucre 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 parlour. The stem is strongly curved; the leaves from one to two feet long, more or less, flat, bipinnate, ovate cordate leaflets, which are usually obsolete at the base, often constricted, and surrounded by a carmine-cordate border. The calyx is incommensurate, the style rather short and thick. This plant is a native of the south 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 saffrole.

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 Flora Medicinal.)

OPTOMETRIC (from the Greek oπομετρικος, to see, and προφορος, a measure) is an instrument devised for the purpose of ascertaining with precision the refractive powers of imperfect vision, whether a person's eye is myopic or hypermetropic, and to determine what refracting instrument would be most suitable for it. 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. Thomas Young.

Dr. Porterfield's contrivance consisted of a convex glass lens fixed 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 intermediate positions of the lens and screen the spots united 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 were drawn two lines of its length, with a narrow space or well-defined black line. 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 small aperture or with two small apertures, on the distance of each varying from ⅛ to ⅓ of an inch, but not exceeding the diameter of the pupil of the eye.

On applying the eye to the 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 distinct; beyond that point the line gradually increases in breadth, becoming again ill defined. On applying the eye to a double aperture, the line appears to be double, the part seeming to cease 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 to become indistinct. The point of intersection is at which a single 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 the observation, held opposite to 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, converged to form a distinct image in the retina, and 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 was supposed that a person whose sight is perfect sees a small object at a distance, and that the eye of the person will be true, as far as the eye is concerned, to a point of the object. Young, 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 a perfect vision, a person whose vision is myopic, or one whose vision is myopic, or one which has distinct vision of small objects only when they are at greater distances than 8 inches) on looking through the slit and observing the place where the images of the two lenses met, would see the object 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 optometer, which were to determine the virtual focus of a convex 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 natural vision.

But the scale of Dr. Young's optometer being, for convenience, only 8 inches long, and the inferior limit of distinct vision in a presbyopic eye being beyond that distance, Dr. Young endeavoured to ascertain in what manner the eye accommodates itself to distinct vision for objects at different distances from it; and his conclusion was that the faculty depends entirely (Lectures on Natural Philosophy, vol. ii. pp. 570-603) upon changes of figure which take place in the crystaline lens.

ORCAGNA, or L'ARCAGNUOLO, is the name by which ANDREA DI CIONE, a celebrated old Florentine artist, is generally known; he is by llamohin Gençu, which appears to be his proper name. Vasari calls him Orcagna. He was painter, sculptor, and architect; was born at Florence in 1338, according to Vasari, or according to other sources at 1339. He was a pupil of Masaccio, and then of Doni, his most celebrated master, from whom he passed into the school of Andrea Penno. He painted several works, together with his brother Benvenuto di Andrea. In the latter part of his life he lived in Santa Fe, where he received in 1360 the last judgment. He was born at Florence, in the year 1380. He built also the church of the monastery of Or San Michele, and designed the celebrated tabernacle of the Virgin of that monastery. It is a high Gothic pyramid, with an altar to the Virgin, fixed on all sides, in a vault of white marble, and is richly ornamented with figures and other sculptures. The following works are inscribed on the base: Andrea Cione pictor Florentinus orariori archichrislorum extitit hujus MCCCLXXII, dedicated to the Blessed Virgin of the New Beginning. Florence, 1543. He was also a designer of monuments, for the Portinari, and for the Last Judgment and the Predestination. He was also the author of a work entitled Bo. G. Orcagna, 1543.
addressed to Orsagna. He died at Florence according to Vasari in 1389, but according to Muni in 1376.

He was a man of great taste in architecture, and has the credit of having been the first in those ages to adopt the British style, which required an act of legislation to be passed in the curia; 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 that form of the arch in Italy: Arnoldo di Paco, however, and his architect, have the credit of the semi-circular arch. Those, says Lanzi, who are fond of minute detail in minute things, may consult Baldincoci, Bottari, and Muni, concerning Andrea di Clone. Rumohr, however, was the first to show how reasonable a con- traiction, Lo Archangelou Lo 'rchagno l' archanghlo. in painting, Orsagna did not go beyond Giotto; in sculpture he was a worthy follower of the Pisan. According to his epitaph, which is given by Vasari in the first edition only of his work, he was chiefly excellent as a sculptor, or rather statutory.

His portrait, published in Vasari's work, was taken from one of the figures of the apostles in the above mentioned tabernacle of the Virgin, which is understood to be his own.

(Vasari, Vie de' Pittori, etc., and the Notes to Sonnini's translation of Vasari; Rumohr, Italiensche Forschungen.)

ORDER IN COUNCIL. This expression is chiefly known in connexion with the measures which the Great Powers took 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 of retaliation had the effect of transforming the Caroline islands into a place of execution.

During the war, the British government, with great prudence, decided to exercise the measure of blockade, rather by voluntary or by compulsion, gave obedience to the decrees. Full account of the matter will be found under the head Blockade, E.C. There has been much dispute as to the legality of these orders. The law of nations has acknowledged the blockading of lines of coast against the 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 coast. The British government, however, had the coast, as well as the other coast of Holland. 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 licence, 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 in this country, except so far as it may be authoritative upon the law of nations. It was maintained that they were merely part of the execution of the royal prerogative of declaring and conducting war, and that they were methods of legitimate retaliation, by which individual states were but as well as of their own subjects. Thus the measure of blockade, being an exercise of the royal prerogative during war, in prohibiting the supplying of the enemy with commodities contrary to 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 been tried 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 of corn from Great Britain. To 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 who had suffered by reason of that order. The same was done in 1874, when the order declared, which order could not be justified by law, but was so 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 they are within the justification of the national war policy—and all orders suspending the operation of any act of parliament, would require an act of legislation; 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 that form of the arch in Italy: Arnoldo di Paco, however, and his architect, have the credit of the semi-circular arch. Those, says Lanzi, who are fond of minute detail in minute things, may consult Baldincoci, Bottari, and Muni, concerning Andrea di Clone. Rumohr, however, was the first to show how reasonable a con-
The following are romances.

Lorenzo Malcondo ... Spanish 1588
Juan de Fuca ... 1592 Proposed to have discovered the North-west passage by sailing through the Continent of North America.

Fonte, or De Fuentes ... Spanish 1640. 77°.

This last is a palpable forgery, and was first published in 1706, in London, by the well-known Miscellaneous, Memoirs of the Curious. Neither Fuentes nor Fuca was ever noticed by Spanish writers. Fuca invented his story with a view of getting commissions from English; Fuentes never did anything but write.

Hukley, in his ‘Collection of Voyages,’ published in 1599, states that Drake merely reached the lat. 42°, 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 he places the northern point of Drake’s voyage in latitude 45°.

The authorities for the higher latitude are: 1. ‘The World Encompassed,’ printed in 1628, under the superintendence of Francis Drake, a nephew of the admiral, which states that the coast ‘was searched diligently even unto 45°’. 2dly, Fletcher, who accompanied Drake, and whose MS. is in the British Museum. 3dly, the celebrated navigator John Davis, in ‘The World’s Hydrographical Discovery,’ printed in 1626, 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 back side of Newfoundland.’ An authority which ought to decide the question; and yet the limit of Drake’s discoveries, 4thly, Admiral Sir W. Monson, who had served under Drake, and who says that Drake ‘ventured upon an unknown sea in forty-eight degrees.’

The Spanish explorations in the Pacific, 1781, published under the name of Fonte, Valdes, 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, the 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 ranked as confirming, since the voyages of Peres Hecquet and Bodega were not made known until 1802. (Wolf, ‘Institutes du Droit des Gens,’ p. 213; Vattel, book I. l. xvii. § 207.) The discovery must be made public, otherwise the presumption 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 entitle foreign nations to recognise and respect the title first obtained.

Such was the condition of the title by mere discovery when the Spanish officer, Captain Martines, in May, 1786, seized the British vessels the ‘Iphigenia,’ ‘North-West America,’ and the ‘Lady’ the ‘Argonaut,’ Captain Colnett, and the ‘Princess 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 was asserted by Spain objects 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 of those grounds on which claims of sovereignty, navigation, and commerce usually rested.’

This dispute was terminated by the Convention of the Escural, dated October 28, 1790, 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 asked whether Pitts could be made to do it, 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 the 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 at 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-coloured’ to the north, 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 burthen 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 mere private trader, who was sent from his Government with the express charge of having 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 to the river was a mere spy on the geography of this region. The British Government under General Sir George Prevost demanded possession of the title to the coast, and their discovery does not affect or impair such a title.

After Nootka Sound was delivered up in 1790, the Spanish 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 follows—

Name of Traveller. Flag. Date. Itinerary.

George Vancouver ... English 1793. Crossed the Rocky Mountains and discovered Fraser’s River.

Lieutenant David Thompson ... English 1806. First Settlement West of the Rocky Mountains in 54°, speedily followed by other settlements among the head-waters of Columbia.

Lieutenant Lewis and Clarke ... Americque 1804-5. Explored the Southern branch of the Missouri, the Yellowstone, and descended the main stream.
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Astor's Company. American. 1811. Established Astoria, at the Southern mouth of the Columbia, which was subsequently sold to the North-West Company.

Thompson, North-West Co. English. 1811. Descended the Northern branch of the Columbia and main stream to the mouth.

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 Wash-ington—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 1818, the persons resident on the Columbia, having full power to do so, 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.

After the war the American government claimed Astoria, under 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 being prevailed on to the post as not being captured, and that the treaty had already 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 free intercourse of both nations, to settle the 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 Mississippi River, the sea, and the states to 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 conferred a title to the coast north of 49°, 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 was still in force, but the Congress of the United States in April 1846, authorised the notice to terminate it to be given.

1. The government of the United States contended, 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 as correct. It is held that the Oregon branch is not 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 was from the British, and that the British merely 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 declined with a view that the enterprise 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 Nelson, whose title was sanctioned and approved of by their sovereigns, and notified to the world—on the acknowledgment of the title made by Spain in 1790—on the resumption of Nootka in 1795, as evidence of the 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 1814, in 1816, and in 1827—that the treaty with Spain was respected, and which was recognised by the United States before its treaty with Spain in 1818, as well as subsequently in the treaty of 1837.

Great Britain cannot 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 any part 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 required 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 offered part of the territory between the Columbia and the river. 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 49° 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 right. The inhabitants of the United States have been offered to refer the question to arbitration, and the last offer was very reasonable for proposing that the arbiters should be civilians, in order to avoid the apprehension which republicans might have of a military tribunal. The offer has been refused, and the last refusal was accompanied with most objectionable reasons.


OREGODAPHNE, Mountain Laurel (from oregus, mountainous, and laurus, a laurel), a genus of plants belonging to the natural order Lauraces. It is known by its flowers, each with 6-parted nearly equal calyx, the limb eventually disappearing. It has 5 stamens, oblong anthers, with narrow filaments, 4-celled, the 3 inner looking outwards. The fruit is succulent, more or less immersed in the expanded tube of the calyx. The flowers are panicked or racemose, axillary, and occasionally umbellate. O. opusflora is native of the woods of Fan and the Rio Negro. It has 2 oval leaves, pale ochraceous when young. O. cupularis is a very large tree, with a strong-scented
wood; it has ovate, toothed, leaves, acute at both ends, sometimes
sitting, ending in a channelled stalk, ob-
ately notched, smooth; the axes of the coastal veins without
pores. The flowers are in clustered few-flowered rough hoary
vivaces below the axillary and terminal bud. The calyx of the
fruit has three of the placenta, which is the character of the
Ist of France, where it grows, and also in Bourbon and
Malagascar.

(Lindley, Planta Medicin.)

ORGANIC CHEMISTRY. [TURBIA, ANIMAL, P.C.S.] 

ORGANON. The article ORGANON in the F. C. con-
tains a general view of the nature and object of logical science;
and the article SYLLOGISM contains all that is necessary on that
subject. They will help anyone is still wanted to complete
what has been already given.

The 'Elementa Logicae Aristotelicae,' by Professor Tren-
denbourg, Berlin, 1842, 2nd edition, consists of passages se-
lected from the works of Aristotle, which passages may be con-
sidered as containing the elements of the science. Those
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 gymnasium, and as a preparation for
philosophical studies.

The following article is simply a translation of these ex-
tracts, which are retained in the order given to them by Tren-
denbourg, with references to the places in Aristotle which
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 (Erleutertungen zu den
Aristoteles'sen Logiken, Berlin, 1842, signed by the same author),
he has more fully explained his views in making
these extracts from Aristotle, and the following re-
marks are his: At the time of the Reformation Luther
saw clearly the advantage of logical instruction in the
high schools, and he viewed it correctly as the completion of the
grammarical instruction. The circle of studies in modern
times has been wonderfully enlarged, and it has been found
necessary to give a distinct 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 it the more necessary to discipline the mind in such
manner as to see a unity in all the powers, and
not be bewildered by the variety of objects whose connec-
tion 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 blamed by others who do 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 sub-
ject to a form of logic, the same with the, and opposed to its
real character. 'We have,' says Trenendenburg,
'trumped to restore this real character, and thus
brought Aristotle nearer to the objective demands of modern
times.' This view logic as purely formal, view it
differently from Aristotle, and they 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 recognized. 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 better 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 a mass of connected notions (begriffe) in their simple naked-
ness, which lie hidden in all our knowledge and govern it.
As these notions are hid or concealed in our knowledge, they
appear dry and lifeless when they are produced in their naked
form, unless the teacher has to show them to the pupil their
real significance, to make him see their actual value in their
application. Now the instruction in the Ger-
man Gymnasium, as in the higher schools in Great Britain
and Ireland, is in the learned languages and to mathematicians;
and accordingly the teachers in both these departments, if they are
to be making any useful work as Trenendenburg'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 illustrations (Enlärkungen) to
the Elements of Logic. He says: 'This is precisely the form in
which I suppose that they ought to be presented to the pupil, but
merely to render clear the fundamental notion of the logical relativeness 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. The student will need a man who
has 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.

Outlines of Logic.

(1.) In things in which formal is as much falsehood and truth,
there is a composition of ideas as though they were one. (De
Annis. iii. 6.) For falsehood and truth are concerned
with composition and separation. Accordingly nouns and verbs
are opposed to each other: 'This man,' 'I,' 'the verb.'

(2.) All speech (λόγος) is significant, but not all enunciative
(διηγήσεως), or significative, or every enunciative speech
true 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 Interpr. c. 4.)

(3.) Speech is enunciative, or signifies either substance (οὐσία)
or quantity, or quality, or relation, or where
(space), or when (time), or position, or possession, or acting,
or being acted upon. And substance (οὐσία) is, to give an
example, such as 'man,' 'horse,' 'quantity,' 'quantity,
such as two cubits, three cubits: and quality, such as
white, grammatical: and relation, such as double, half,
and where, such as in the Lyceum, in the aerop: and when,
such as yesterday, the next year; possession, such as he is
sitting: and possession, such as he has shoes on, he is
armed: and action, such as he cuts, he burns: and being acted
upon (συνέκτημα), such as he is cut, he is burnt. (Catug. c. 4.)

(4.) The art of the undifferentiated

(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 indiscriminate,' because it
may 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 noun, there is neither affirmation nor negation. (De Interpr. 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 Interpr. c. 5.
A Proposition (πράττον) 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, and that
particular which belongs either to some one, or to not some one,
or not to all; and I call that indefinite which either belongs
do not belong, without the universal or particular, as, for
instance, what is placed below this science; and that
pleasure is not a good. (Analyst. Pr. i. 1.)

It is very evident that the universal is more efficient, be-
cause, knowing the first of two propositions we know in a
manner the second also and have it potentially; for example,
If a man knows that the angles of every triangle are together equal to two right angles, and that the single or the angles of an isosceles triangle also are together equal to right angles potentially (tornai), even if he do not know that the isosceles triangle is a triangle. But he who knows this proposition and of the affirmative proposition, either universally or potentially or in reality (tornai). And the universal is an object of the intellect, but the particular terminates in the sensuous perception. (Analyst. Post. i. 24.)

(7.) Whatever is, or to what must be, or to what can be, is. (Analyst. Pr. i. 2.)

(8.) Of all things indeed which exist there are some of such a kind that they can be predicated with truth universally of nothing else but the single thing, and what is an object of some; 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 that there are some things which exist cannot be predicated of anything is manifest. For of sensuous objects nearly every one is such that it can be predicated (propagredous) of nothing. (Analyst. Pr. i. 27.)

The genera are predicated of the species, but not the converse, the species of the genera. (Categ. e. 5.)

(9.) It is impossible for the same thing at the same time to belong (avitréous) and not to belong to the same thing and in the same manner. For if the earth move, we would have the most certain; for it is impossible for any one to conceive that the same thing is and is not. Wherefore all who demonstrate, can neglect (their demonstration) to this ultimate notion. (Metaphy. 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 variance. (Eth. Nic. i. 8.)

(10.) And since it is possible for what belongs to be enunciated as not belonging, and what does not as belonging, and what does both belong, and what does not long as not belonging, and with respect to other things than the present in like manner, it is possible to deny both all 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 (avitréous) be this, affirmations and negations opposed. And I call opposition (dilxestelas) the contradiction of the same thing about the same thing, but not opposite. (Comp. Categ. e. 1; De Interp. e. 6.)

Contradiction is opposition (avétrin) in which there is no mean in itself. And as parts of contradiction, there is on one side the affirmative, and on the other side the negative, and knowing something from (kiv) something. (Analyst. Pr. i. 2.)

In affirmation and negation always, whether it is a thing that exists or does not exist, the one will be false and the other true, or the one true and the other false, and the universal 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, to 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. e. 10.)

(11.) Things included under the same genus which differ most from one another, are defined to be contrary (tivr'do) (Categ. e. 6.)

(12.) Therefore I 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—not every man is white; 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 the same expression (eita koiito) four—namely, all and none, all and some, many and none, some and none; but in truth there is 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 contradictory). (Analyst. Pr. i. 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 propositions some are universal and some particular and some indefinite, of necessity the proposition which is universally negative can be converted (avtropia) in its terms (Eos): 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 propositions are invariable 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 'man.' (Analyst. 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 consider 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 reasoning; 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, when we know that the sun is eclipsed and that the earth moves, we ask why the earth moves. These things accordingly we inquire after thus; but some things we inquire after in another manner, as for example, whether there is or is not God. (Categ. c. 8.)

simply mean if there is or is not, but 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. (Analyst. 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 things which are and to know the Why. (Analyst. Post. ii. 19.)

(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. (Analyst. 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. (Analyst. 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 we know them, which is more known. And we are acquainted with, and know 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 those things which are further from the sense, and are not the same as the former, and the nearest are the particular. (Analyst. Post. i. 2.)

(20.) We get certainty in all things either by syllogism (syllogismos) or by induction (inveni). (Analyst. Pr. ii. 28.)

We learn either by induction or demonstration (diketosis) and demonstration proceeds from the general, but induction from the particular. (Analyst. Post. i. 13.)

(21.) And syllogism is 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. And I mean by results through them; and I mean by results through them, that there is need of any external term for the necessity to be. (Analyst. 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). (Analyst. Pr. i. 1.)

(23.) Whosoever is affirmed of the predicate, will be affirmed of the subject. (Categ. c. 11.)

(24.) When three terms are so related to one another that the last is in the whole of the middle, and the middle is in either or not in the whole of the first, of necessity there is no term, some and none of the extremes are equal; and I call middle that which is both itself in another and another in it, and which also by position becomes middle; and I call extremes both that which is in another, and in which another

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is. If A can be predicated of all B, and B of all C, necessarily A can be predicated of all C. And I call a figure (ευθέως) 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 that which is predicated of both, or neither, when the middle term is placed without the extremes (δεκας), 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, it will be a syllogism, in which one or another, or both of them, if it be in 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 X will belong to no part of N: for this also has become the first figure. And since the negative proposition is convertible, neither will N belong to any part of X, so that there will be the same syllogism. An affirmative syllogism is not produced by means of this figure, but a syllogism belongs to the universal affirmative syllogisms and the particular syllogisms. (Analyt. i. 5.)

(26.) But if one thing belongs to the whole of the same thing and another belongs to no part of it, or both to the whole of the same, but such a figure I call the third; and if the middle term be thought of in it of which both the predications are made, I call I the extremes the predicates: 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 L belong to all S, S will belong to some part of R of necessity, if the affirmative is convertible, S will belong to some part of R, so that since P belongs to all of S, and S to some part of R, of necessity P 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. 28.)

(28.) It is necessary in all the figures that the middle be in both in the propositions. If then the middle term both predicate and be the subject of predication, or itself predicated and subject, if it be the same term, it will be the middle figure: and if other things are predicated of it, or one thing is denied and another predicated, it will be the last figure.

(29.) 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, holding the all, it will not be a syllogism: and if he should assume that music 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 middle figure the syllogism is not affirmative, and (the question) 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. 21.)

(31.) All who attempt to syllogize from things less credible than the conclusion, manifestly do not syllogize rightly. (Top. vii. 5.)

(32.) If what is true is not possible to form a false conclusion, but what is false is it 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, or both. The argumentation (epainetois) of Socrates is derived: but when the conclusion is true, it is not a 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 to be true. And the reason is that, when two things are so related to one another, that when one is of necessity the other is, when this other is not, neither will the first be, but when it is, it is not a matter of necessity that the middle is in the position 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 is called a contentious syllogism (φασιστικός συλλογισμός). (Top. vii. 12.)

Contentious speech is the syllogizing from notions that appear to be common notions, but are not; or it is merely apparent syllogizing. (Soph. Blanch. 2.)

And again, so an argument (κριτική) would appear to be productive of doubt. (Top. vi. 5.)

(34.) Induction (ισχυρός) is the progress from the particular to the universal: thus if a pilot who is skilled in the best, and if he does a thing without exception, the person who is skilled in each thing is the best. And induction is the more persuasive and more clear, and more intelligible to sense, and in rogue 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 extreme to syllogize with another with 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 make the syllogism through induction is the clearer. (Analyt. Pr. ii. 28.)

(37.) Probable (σίζης) and Sign (ενεποτις) are not the same, but Probable is a proposition conformable to opinion: for what is probable to this particular way or not produced, or to be not to be, this is probable; for example, that men hate the envious, or like those who love. And Sign must be considered to be a proposition demonstrative either necessary or conformable to opinion: for if when any thing is, the thing is, or when any thing has happened, the thing happens before or after, this is a sign of the thing happening or being.

Entitmythen then (σεβήσκες) is a syllogism from probable or signs. (Analyt. Pr. ii. 27.)

(38.) And an example is, when the first is shown to belong (ενεποτις) to the middle through the like. The third. But it must be shown that both the middle and the first are like 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 Thebans, 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 from the character of the war of 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 Phocians is bad. Again, 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); but that A belongs to C: and the Thebans is shown through the Phocians.

And in the same manner also if through more like things,
the evidence should exist of the middle belonging to the first.

Accordingly it is manifest that the example is neither as a part to the whole, nor as a whole to a part, but as a part to a part. In fact it belongs to both B and C, and the one is known. And it differs from induction, in as much as induction by means of all the particulars shows that the first belongs to the middle, and does not connect the syllogism with the thing exemplified. The example both cannot itself and does not derive its evidence from all the particulars. (Analyt. Pr. l. 24.)

(30.) Both modes of proof, that by syllogisms and that by induction, teach by means of things known before; the one taking as a basis two things which are subordinate to principles are known through other things, and the other showing the universal through the evidence of the particular. And in the same manner rhetorical arguments persuade; for they (the arguments) are either by means of example, which is induction, or by means of enunciates, which is syllogism. (Analyt. Post. i. 1.)

(40.) Refutation (λεγεται) is a syllogism of contradiction.

(41.) And objection (πράσμα) is a proposition contrary to a proposition. And it differs from the proposition, in as much as it is possible for the objection to be particular, but the proposition either cannot be so at all, or not at least in the universal syllogisms. (Analyt. Pr. l. 26.)

(42.) Since it is the nature of some things through themselves to be known, and of some through other things (for principles (προφητεία) are known as things subordinate to principles are known through other things), when any one attempts to show through itself a thing not known through itself, then the thing to be proved (τὸ δὲ διὰ τοῦτον) the proposition of which the person who attempts to prove it is an objection.

And people appear to assume what is to be proved in five ways. Most manifestly and first, if a person should assume what requires to be proved. And this in itself does not easily escape notice; but in common names (ἐπιστήμη) and in all those things in which the name and the notion (ὁρισμός) have the same meaning, it is more easy to escape detection. And the second way is when a person assumes the universal when it is necessary to prove the particular; for example, if a person attempting to show that of contrary things (ἀληθεία) there is one science, should universally assume that of opposed things (ἀληθεία) there is one science; for be appears to assume with many other things that which it was requisite to prove by itself. The third way is, if any one, when the thing proposed is to show the universal should assume the particular; for example, if he had to prove that of all contrary things there is one science, he should assume that there is one science of some particular contrary things; for such a one also appears to assume separately by itself which it was requisite to prove together with others. Again, if he who should admit them (οἱ δὲ οίκου) by dividing it; for example, if, when it was required to show that the art of medicine concerned both health and sickness, he should assume each separately. Or if any one should assume the universal, which is not the nature of the particularity; for example, that the side (of a square) has no common measure with the diagonal, when it was required to show that the diagonal has no common measure with the side. (Top. viii. 13.)

(43.) The affirmative (demonstration) is prior to the negative, and more easily known, for through the affirmation the negation is known, and the affirmation is prior, as being also is prior to not being. Further, it is nearer to a first principle; for without the positive proof there is no negative proof. (Analyt. Post. i. 25.)

(44.) All persons who form a conclusion through that which is in an errour form a false conclusion, but they show what has to be demonstrated by virtue of an hypothesis, when anything impossible results by the assumption of the contradiction (ἀντιμετώπωσις) (10). (Analyt. Pr. l. 50.)

The contradiction which leads to an impossibility is thus: If it were required to show that A does not belong (ὑποκύπτει) to B, it must be assumed that it does, and that B belongs to C, so that it follows that A belongs to C. But let this (A) be the object of demonstration, and agreed to be true. Then it is not possible for A to belong to B. If then it is granted that B belongs to C, it is impossible for A to belong to B. And since the affirmative (ἀπειροπώσις) demonstration is better than the negative (ἀναπειροπώσις) demonstration which leads to impossibility. (Analyt. Post. i. 20.)

(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 cannot be otherwise, but opinion is unsettled (Analyt. Post. i. 38.)

(46.) Induction is not possible when there is no sensible perception; for sensible perception belongs to the particular. Nor yet through sense nor through perception is it possible to attain science. And therefore, the object of science is not being in the same thing as being of a certain quality, and not to any definite thing, nevertheless it is necessary to have some one definite thing as the sensuous object, and the where and the when.

But what is universal and imperceptible, and that which is the sensuous perception of, for it is neither any particular thing nor now; for, if it were, it would not be universal; for we affirm that the always and the everywhere are universal. Wherefore also the object of induction is not to perceive 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 sensible perception of the universal. (Analyt. Post. i. 18, 31.)

(47.) And I call universal whatever belongs to all both of itself and in itself. It is manifest then that whatever is universal of necessity belongs to the things, and the 'in itself' and 'in itself' are the same; for example, of itself a point belongs to a line insuch as it is a line; and to a triangle, insuch as it is a triangle. And to the right angle insuch as it is an angle; and for itself the triangle (as to angles) is equal to two right angles. And the universal then, when it can be demonstrated of any individual (of the class) and of no class prior thereto. (Analyt. Post. i. 29.)

(48.) To what thing anything of itself belongs, that very thing is its own cause (αἴρετος); and the universal is first, therefore the universal is the cause. (Analyt. Post. i. 24.)

(49.) Universally, of all things it is impossible for there to be demonstration; for it would proceed indefinitely, so that there would be no demonstration at all. (Metaph. iv. 4.) And it is not possible for the thought to go through the infinite. (Analyt. Post. i. 29.)

(50.) And those things are true and first which not through other things, but through themselves receive assent; 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 assent. (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 specified. If we believe both against 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 proposition that there is no common measure with the side.

(51.) But we assert that all science is not demonstrative, but that of the immediate (αὑριστοῦ) is incapable of demonstration. And that nothing of necessity is known, in that it is necessary to understand the prior and those things from which the demonstration comes, and the immediate at any time enter into the demonstration, it is a matter of necessity that the immediate are not capable of demonstration. And this we so affirm, and that there is not only science, but also some first principle (ἀρχή) of science by which we know the things (ὅσα). It is necessary not only to know first the first things, either all or some, but also to know them more; for always that 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. (Analyt. Post. i. 13, 2.)

(52.) And an immediate proposition (συνάρκτικον) is a beginning (ἀρχή) of demonstration, and an immediate proposition is that to which there is no prior proposition. (Analyt. Post. i. 2.)

(53.) And an 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 axion (ἀξιώμα). (Analyt. Post. i. 9.)

(54.) The first things will be definitions (ὑπόθεσις) incapable of demonstration. For definition is of what the thing is and of essence; but all demonstrations appear to go by hypothesis and to aware what a thing is, for example, (Top. viii. 13.)

* See Cæs. v. 3, definition of Διάταξις and Ἀπεριτωπώσις.
the same thing as to be related to something in some manner, and this is impossible without the one to know the other; wherefore it is necessary in the notion (άναθος) of the one that the other also be included.

Another way is, if a man uses the very thing which is defined, as in the above case, he escapes notice, when he has 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 requisite in order that such errors may be detected to exchange the name (άναθος) for the notion (full speech, ἄναθος), 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 not spoken of the sun. Again, it may be supposed that he who has employed the word day has employed the word sun. A third way is, that 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. (Zop. 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 an eclipse? Or why is the moon eclipsed? Because the moon is between the sun and the earth, but they have all 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 (άναθος): 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 is sought 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 example, if Achilles is magnanimous, or Achilles, Ajax, and Agamemnon, we shall find that they have all in common, the absence of insult; for the first was war, and the second was enraged, and the third killed himself.

Again in the case of others, such as Lycurgus or Socrates; if difference 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 feeling (μισεία) as to fortune, and non-endurance of insult. If then these things, in the same case, there must be two species (τίτων) of magnanimity. (Analyt. Post. ii. 13.)

(57.) Of the things indeed which are in the definition each will extend further, but all will not extend further. For of necessity there must be this essence (ζωή) of the thing: for example, there is number in every Three (τρία), odd (πράπτω), and the prime in both ways, both so as not to be measured by any number and not to be composed of numbers. This then is Three, number odd, and prime, and in this manner: for of each of these things some are in all odd numbers also, but the last is in Two also, and all are in none. (Analyt. Post. ii. 13.)

(58.) And it is necessary, when a person is labouring at any whole thing, to divide the genus (γένος) into things indistinguishable in species, the first: for example, to divide number into the odd (πράπτω) and even (κόης) species. 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. (Zop. vi. 6.)

(59.) If you should fall under accident, 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 shall be a difference (διαφορά) in it (the genus). (Analyt. Post. ii. 13.)

It is requisite moreover to divide by privation (απώνοια), and those who 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 Partib. Animal. i. 3.)

(60.) Definition consists of genus and differences. (Zop. i. 6.)

It is requisite that he who defines well define through genus and differences, and those belong to those things which are given with each and prior to species, 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 Partib. Animal. i. 3.)

(61.) 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 the thing exists. (Analyt. Post. ii. 2.) 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 (άναθος) appears to have evidence to phenomena, and phenomena to the notion. (De Coot. i. 8.)

(62.) The cause is the middle (μέσον), and in all things this is sought. (Analyt. Post. ii. 2.)

(63.) Not only that a thing is, is oftentimes the definition (άναθος), and not the middle (μέσον), and not the reason, for example, what is quadrature? Is it a regular equilateral square being equal to a figure of unequal sides? And such a definition is an expression of the conclusion. But the definition which says that square is a figure of a middle, states the cause of the thing. (De Coot. ii. 2.)

(64.) And it appears that not only that what a thing is, is useful towards knowing the cause of the accidents of essences (τὰ τοῦ ἐγχείρημα τῶν ἀνείσερων), as well as to their being, and the straight line is and what a curved line is, or what a plane and a plane arc, is useful towards seeing how many right angles the angles of a triangle are equal to, but conversely also the defining the thing which is greatest, it is evident that the thing which is, and what is the cause of the thing is: for when we are able by the appearance (ἐξουσία) to give an account of the accidents 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 (εἰπώ τινα τοῦ), 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 (μισείας) and empty (μετρεῖον). (De Animal. i. 1, § 8.)

(65.) And of some things some other thing is the cause, and of other things not.

According to him who manifest that of those also which belong to the class of what a thing is, some are immediate (ἀκόλολ) and first principles (στροφὴς), which we must assume (ἐπιλεκτικόν) both to be, and we must assume what they are, or in some other way the clear, as it were the other, which common to both what unity is and that it is he assumes. But as to those things which have a middle (μέσον), and of which something else is the cause of the essence, we can, as we have said, show by the demonstration of the double what things are. And if that which takes for granted either of the parts of the enunciation, for example, that a thing is, or is not, is Hypothesis (ἐπίθεσις); but the proposition without this is Definition: for the definiti-
tion is proposition (δέους); for the arithmetician lays down (πας, places, ἑπέρα) that the unit is indivisible, as far as quantities (δύος) of which it is not hyphenable: for when the unit is and that there is a unit is not the same thing. (Analyt. Post. i. 2.)

(67) All demonstrative science is about three things, two of which are no accidents (ἀφάντα) of which it is not hyphenable: for when the unit is and that there is a unit is not the same thing. (Analyt. 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 (αρχές) and that which is indivisible (διαφανές) 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 most, that science also will be both more and most. (Analyt. Post. i. 9.)

(69) Accordingly it is impossible to have science from demonstration, if a man does not know the first principles which admit of no middle (κατάλληλα) for those he has before been said. But as to the knowledge of things which want a middle, a man may be in doubt. All animals have an innate discriminating faculty, which men call perception (αἴσθησις). And as they have sense-organs, so they have distinguishing sense-organs (μυς) of the thing perceived (ὁσανύμος); and in others there is not. In those animals, then, in which it is not, there is neither wholly, or with respect to things of which there is no perception. And those things they do not perceive: 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. And many animals being such, there results a difference among them, so that some 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 (πραξια), as we call it, which is quite another experience. And from experience, or from a whole thing remaining tranquil in the mind as one thing apart from the many, whatever thing in all these things is as one and the same thing, is the beginning of art and of science; if about production (ἐργασία), of art; if about that which is or being (εἶναι), of science. Neither indeed do the faculties (ἐφευρέω) exist in the mind separate, nor do they proceed from other faculties which are more intelligent, but they proceed from perception; as in battle when a flight has taken place, when one stops, another stops, and then another, until order is restored, and the mind exists in such a manner as to have the faculty of knowing and of perceiving (γνωρίζω) what are not different stands, it first of all is the mind as universal (for the mind perceives the individual, but the perception belongs to the universal, for example, it belongs to mankind, but not to this (ὁμοιοί) and again to those until the individual and the universal have abided: for example, such or such an animal abides, until animal generally abides; and this in like manner. It is manifest then 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 (επιστήμη), by which we learn the truth, some are always true, and some admit of falsehood, as opinion and reasoning (λόγος-μετάφρασις); and since science and intellect (ἐνεργεία καὶ γένος) 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 (λόγος),* there can be no science of the first principles: and since nothing can be truer than science except intellect, intellect must be intellect of first principles: and this appears both from considering these things, and that the beginning of demonstration is not demonstration, that neither is the end of the beginning of science. If then we have no kind of truth with an external object (διά βιβλίων) must be the beginning of science. (Analyt. Post. ii. 19.)

Ogres, DRESSING, &C. OF. (Mining, P. C., pp. 286, 287; Cocker, P. C., p. 592; Tim. Manufacture of, P. C., p. 471.)

* The word λόγος is rendered 'ravis' by the Latin translation. 'Readefully translates the passage thus: 'kede wamabetai akor nici an eindメニュー verkieslet le.' Perhaps in some may be understood as in No. 2. 'Any' should be rendered as 'λόγος as (Echolocating, Echolocating) to the ear.'
flowers, the peduncles are longer than the linear lanceolate bracts; lanceolate, simple, filamentous leaves. The flowers are white, with a broad green longitudinal band externally. It is found in meadows and pastures in Great Britain, and is the foundering of Tribus Orobanchaceae. Hist. Plant. 7. 7. 10; 11. 12. 13. 14. 15.

Orobacaria. Fraas, Orobacaria. It is distinguished by the brown, tubular, terminal, upper lip, which is often much longer; the middle of the tube compressed on the back; the throat is slightly inflamed externally; the glandular lobes of the lip oblong, with reflexed margins, lower lip bony within, nature of the other lip very various. It is natural to Europe, in Austria, in Germany, and the south of France. It has been rarely found in Great Britain in the fields of Hampshire and Norfolk, and in Ireland. The flowers have a blue blossom. It is parasitic upon Broom, Rape, Lathyrus, and crops.

P. ramosa has a calyx of 4 sepals, tubular, with triangular ovate acuminate teeth, the anthers glabrous, the stem branched. This plant is a native of Europe, and has been found in Great Britain in Norfolk and Suffolk, where it grows on the roots of hemp, and the Gallopois Tintat. There are several other species of Phelippe, which were formerly described as belonging to the genus Orobacaria. All the plants belonging to Orobacarchaeus, have the habits and general character of Orobacineae. The genus belonging to this order are distinguished as follows—

Tribe I. Orobacineae. Parasitical leafless herbs.

2. Phelippea. Calyx tubular, bibracteate, 4-6-toothed or 4-5-cleft.
3. Aeschynomene. Calyx bracteate, 6-cleft, sub-bibracteate.
5. Camphora. Calyx ventricose, 5-parted, bibracteate, corolla incurved; upper lip entire, lower one bident.
7. Lathyrus. Calyx bibracteate, campylopodi, 4-cleft.
9. Alchemilla. Calyx bilobate, bracteate? upper 2-cleft, lower one bisected, the capsule acuminate, pointed.
10. Aegopinon. Calyx spathaceous, capitate many-celled.
11. Amblyanthus. Calyx campylotoid, 4-cleft, both lips of corolla entire.

Tribe II. Orobacaridae. Terrestrial leafy plants.

13. Tussia. Calyx 5-toothed, bracteate? (?) corolla ringent, tubular; capsule 1-seeded by abortion (?)

(Don, Gardener's Dictionary; Lindley, Vegetable Kingdom; Babington, Manual of British Botany.)

OROBACUS. [Orobacineae.]

ORRIS ROOT. [Orobacineae.]

ORROVA. [Orobacineae.]

OSMUNDA, a genus of plants belonging to the natural order Ferns; to the sub-order Osmundaceae. It has been described as belonging to a tribe. The fronds of the flowering Fern, has bipinnate fronds, pinnules oblong, nearly entire, dilated, and slightly auricled at the base; the clusters panicked, 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 lake 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 Ferns.)

OSSIFEROUS BRECCIA, OSSIFEROUS CAVERNS. The existence of large fissures and caverns in rocks is a fact known to miners and quarrymen in all parts of the world; that these cavities are frequently filled with stratigraphical strata 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 considerations which belong to the subject. Great caverns and vast caverns, sometimes confined to limestone rocks, are yet by far most frequent occurrence in these deposits. They are not common in all limestones, but have certain determinate relations to their mass and the positions which they occupy. It is peculiarly in thick masses of limestone, (whether magnesian or purely calcareous)
that we find great caverns in England, Ireland, France, Belgium, North Germany, the Tyrol, Carinthia, Italy, Greece, South Africa, India, Asia, North and South America. It is
sometimes observed that great caverns abound in limestone
rocks, not so much at near to points and lines where
the ordihinary position of the strata is violently disturbed
by earthquakes, or through the action of water on 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 we gradually reach the conclusion of the
dependence of the chasms in the rock on the fractures
which have broken it.

But there are few caverns or great fissures all whose
formation can be explained. The distinction 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 internal surface
which mark the decomposing influences of air and moisture
and the erosive power of running water. Through many of
these water now runs, through more of them it formerly ran,
conducted into these subterraneous 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 in-
fluence of water passing through them. Such a case occurs at
Kirkdale in Yorkshire, where the fissures have cut through
an even floor and roof, and is connected, not with faults or
axes of movement, but with great joints in the limestone.
The cave is a great tunnel, traversed by water coming down
from the hillside. Water dropping through, or passing through the
limestone rocks dissolves (by the almost constant car-
bonic impregnation which it derived from the atmosphere and
decomposing vegetation) its calcareous channels, and trans-
ports away, to the surface of the ground, the materials of
petrifying springs, the tufaceous mounds of Mallock, and the
traversing of southern Europe. In certain classes of lime-
stone rocks there is reason to conjecture that the caverns have
not been occasioned by violent fractures, nor yet by the influ-
ence of joints, but that they are a part of the original
structure of a coral reef (in which cavities were left by the
polyplexe 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, Fran-
conia, &c.

In regard to the filling of these caverns, we are just on
a great majority of instances, appeal to the action of water—
an inverse action, new circumstances causing water to deposit
where once it evaporated: an expedition into the caverns, by
fresh new accidents. Stalactetical depositions and many varieties of
spray accumulations, which are now happening in caverns
and fissures, exemplify the former case, and as an instance of
the latter, we have the famous 'sandstone caves' of the north-
yorkshire coast. Here the chalk is cavernous; the caverns,
connected above with small fissures reaching to a mass of
diluvial clay, pebbles, &c., are continually enlarged by the
water accumulating there, which has eroded away the over-
lying sandstone. Water running in, and the diluvial masses from above pour down
into the cave, but are soon removed by the agitation of the tide.

Another case 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 argilla-
ceous toadstools. Near the edge of these argillaceous beds,
many rather regular pits ('cavern holes') occur, through
which the surface drainage reaches the limestone, and carries
into its cavities some of the materials which are disposed in
its course.

The geologist, who takes into consideration the possible
origin of caverns in limestone from original hollows, the in-
fluence of joint fissures, and the effect of violent displac-
ements; and considers further the various degrees and circum-
stances of their communication to the surface, 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
superincum-
benent on the limestone, will be at no loss to comprehend
how the bivalve mollusc is complicated by the influence of the sub-
terraneous waters; the muddy and earthy contents of subterraneous caverns. 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 water up the fissures, and deposited into the caverns;
and, in addition, certain matters have been dissolved, and deposited in
crystallized and stal-'gnmitic forms.

The occurrence of bones in these breccias, sediments, and
stalagmitic instrusions is sometimes to be explained by sup-
posing them to have been derived, by flowing or being
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 water, and those bones have been left in these
caverns, and there have left their bones. This con-
clusion, established by the sagacity of Buckland for the hyena
caves of Kirkdale and Torquay, applies to the numerous bear
and hyena caverns of the Iberian peninsula, and to
some caves in Brazil and Virginia. It is a conclusion of the
highest importance in geology and zoology. It assures us
of the widest occurrence, in various branches of life, of
caves where the animal species of one or two genera can be
observed, as in the Iberian and Brazilian caves, and which
are frequent in the northern zones of the world, and of
such startling magnitude as to have suggested hypotheses of
diluvial catastrophes, and of glacial periods, to geologists; while zoologists may perhaps
regard it as a great example of the law of limited duration
and successive predominance, to which, judging from the
whole course of palaeontological discovery, all the races of
the animal creation are made subject. The reader may consult
for the facts and inferences thus briefly noticed, Cuvier,
Oeuvres, Paris: Buckland, Reliquiae Diluvii, Meyer,
Palaeologia; Owen, On British Fossil Mammalia, in Trans-
plications of the British Association; and a variety of memoirs
by different authors in the Transactions and Proceedings
of the Geological Society of London.

OSTRACION. [ECL.EDWHEU]MANN.

OTTMER, 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 the youth to pursue
a professional career; but his father's death leaving him free to follow his
own inclination, he made choice of architecture as his future
destination, and certainly had no cause to repent of doing so,
being eminently successful in all the stages of his career by opportunities that fall to the lot of few. While he
was completing his studies in his profession, at Berlin, in 1822;
he was employed to erect the new theatre there, called the Kurf&uuml;ster-Theater. This building was
burned by a drunken man 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 Ottmer forward at once:
he should, however, be mentioned that, although it was not
known at the time, his designs were corrected by Schinkel.

SCHINKEL, K. C. S.

In his next work of note, the 'Sing academy' at Berlin (erected 1826-7), his design obtained
preference of that of Schinkel, although the latter was in very
superior taste, and indeed, one of the happiest ideas of the
great master,' as may be seen by the published drawings of
its in his 'Entwurf,' Planning as all this was, it was not
without its disadvantages, as by immediately 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. There was besides a certain degree
of his being spilt by the exaggerated praises bestowed on his
early efforts,—praises which, it has been suspected, proceeded
partly from a desire to lessen the reputation and keep down
the prices of his works. These were but minor inconveniences;
and after first studying a short time in Paris, he visited Italy,
where he remained nearly two years (1827-5); and where he was so far inspired as to con-
ceive the project of erecting one of the ancient temples and
the Parthenon, which should supersede every known edifice of the kind in extent and
magnificence.
He was recalled to Germany by an invitation from Dresden, where he was to build new pavilions, 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 a great sensation, especially in Dresden, 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 Brunswick, in 1830, the first part of his *Architektonischen 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 a very great deal of ever belting on 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 elevation which is being erected. Still, in should nothing further be ever 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 scheme for the labors most prodigious, and besides that he was obliged to superintend every department of the works personally, from first to last, he designed all the numerous details both of the exterior and interior, which display considerable inventive powers as well as refined taste. The principal elevation of the exterior—extending altogether two thousand feet in length—is entirely of cast-iron, and much equally excellent and novel combinations in its details in other parts. The interior is further 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, Otten erected at Brunswick several other structures, both public and private, all of them, more or less, of architectural note: viz. the Theater-Intendanz, the Infantry Barracks, in the Florentino style, with a facade of 350 feet; the Iron Bridge, the Villa Bulow, New Richmond, the Schmidsche-Haun, the Interim Railway-station, &c. &c. He also made a design for Cavalry Barracks at Brunswick, in similar style to those for the infantry; which design was published in Ronsberg's *Zeitschrift für praktische Baukunst,* 1838. But that design, which he has since withdrawn, will perhaps remain unedited. Naturally of a delicately constituted, Otten sank under the haras of business and the multiplicity of his tasks in the prime of life, August 22nd, 1843; but he had lived as a man of the century, hardly would he have had such another opportunity as that afforded him by the Palace of Brunswick.

**OVAL, 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**

\[ y = \frac{1}{x} (x^2 - a) \]  

\[ (x^2 - b) \]  

\[ (a \text{ and } b \text{ being positive; and } a \text{ less than } b) \]  

\[ \text{has an oval extending from } x = a \text{ to } x = b \text{, but there is no curve whatever from } x = a \text{ to } x = b, \text{ or from } x = b \text{ to } x = 0. \]  

\[ \text{If } a \text{ be small, the dimensions of the oval are small: and when } a = 0 \text{ the equation becomes} \]

\[ y = \frac{1}{x} \sqrt{x^2 - b^2} \]  

\[ \text{in which the oval has become a point (the origin), and is a conjugate point (Curv. P. C.):} \]

\[ \text{of which it is an asymptote, but which is on no continuous branch.} \]

Some conjugate points have none but imaginary values of \( y = \sqrt{x^2 - b^2} \) and \( y = -\sqrt{x^2 - b^2} \), which is a conjugate point at the origin, and \( y = \pm \sqrt{x^2 - b^2} \) is then imaginary: but when \( x = \sqrt{x^2 - b^2} \) there is a conjugate point at the origin, and \( y = \sqrt{x^2 - b^2} \) is 0. The meaning seems to be (as far as we can judge from a few instances) that such a point is a kind of cusp, 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, the other tends to the finite limits. Thus when \( x = 0 \), the ends 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 one of the points to which our attention is directed, 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 conformed.
OZON

attention of Lord Clarendon. This statesman, who was anxious to reconcile the most moderate of the non-conformist party (Hyon, P. C.) offered Owen immediate prefiguration if he would continue his labours, and was thus encouraged, 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, instead of the 10th Weekley Lecture on 16th Dec. 1667, he 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, 1689. The biographic species described are very widely distributed over the globe. The hardy species require no care. If the roots are planted in a shady border, they will grow and multiply. The greenhouse kinds are mostly bulbous from the Cape of Good Hope. A mixture of the seeds is in a great measure reflected in his works, which, though strongly tinged by the peculiarities of the Calvinistic system, are remarkable for their devotional spirit and are calculated to encourage practical piety. He certainly contributed to that section of his party whom Lord Clarendon designates as 'the more learned and rational.' (Clarendon 'History of the Rebellion,' vol. v. p. 515, see Warburton's note.) His works are very numerous, the best known of which are not already alluded to may be mentioned: 1, 'Exposition of the Epistle to the Hebrews'; 2, 'A Discourse on the Word of the Lord,' 1665; 3, 'A Sermon on the Birth of the Babe in a Shepherd's Stable, to the Answer to T. Biddle,' 1665; 4, 'εὐχαριστία τῆς ζωῆς,' avid de Nat. Ortu, Progressu et Studio Vere Theologic, 1661; 5, 'An Exposition of oxv Psalm, 1660; 6, 'On the Doctrine of the Trinity,' 1661; 7, 'A Letter to Daniel Fry, Alias Gnomon, 1665; 8, A large collection of Sermons and Tracts. His last production was entitled 'Meditations and Discourses on the Glory of Christ,' which it was stated was sent to the press the day he died.

(Don, Gardener's Dictionary: Babington, Manual of British Botany; Lindley, Flora Medic.)

OXYRIA, a genus of plants belonging to the natural order Polygoneae. It has a 4-parted number, and in the 3 interior segments larger; 6 stamens; 2 stigmas; a 1-seeded nut, compressed, with a membranous wing, larger than the persistent segments of the seed. O. raniformis, 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. digynia of many botanists.

OZONE (from the Greek ὄξιν, to smell) is the name given by Professor Schönbein of Basel to an odor evolved during the progress of certain electro-chemical decompositions. It is also produced by common electric sparks, and by the working of an ordinary electrical machine in the air. This odor 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 electrolyzation of any of the following bodies, viz. water, dilute sulphuric acid, solutions of phosphoric and nitric acids, potassa, and many oxides. Ozone yields it in the greatest quantity. It may also be obtained from atmospheric air, oxygen, nitrogen, hydrogen, carbonic acid, and nitrous oxide, by passing the electric current through the least common multiple of the same, and frequently making and breaking contact. Under the influence of heat ozone disappears, and it cannot be obtained from heated solutions, or solutions of hydracids, chlorides, and sulphates. The purity of the gas, and the considerable quantities, prevents its evolution from solutions otherwise yielding it abundantly. It may be developed by electrolysing a solution of muriate of soda with platinum electrodes, by placing the gas collected at the anode over ammonium and water to absorb the chlorine. Ozone can be preserved for a length of time with the oxygen collected in it with well closed bottles. It possesses the property of bleaching linen-paper 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 great 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. A mouse is killed with it in five minutes, and M. Schönbein was immediately affected by breathing an atmosphere charged with it.

The electrodes employed in these experiments have a great influence in respect to the evolution of ozone. With water or distilled water and platinum, or gold, for when the more oxidizable metals are used it enters immediately into combination with them. It can be obtained from air or the gases above enumerated when there is a mixture of copper, iron, silver, or platinum, and zinc negative, but not when these arrangements are reversed, or both electrodes are of zinc. With zinc, when either positive or negative, a peculiar scent is produced in nitrogen and hydrogen. On electrolyzing a solution of sulphuric acids the following results

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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 milky, proving the gas to be carbonic acid. With gas charcoal, sulphuric acid is evolved at the negative pole and carbonic acid at the positive; but no odour of oxygen is produced. With a solution of muriate of soda the odour is not perceptible until the gas obtained from platinum electrodes at the positive pole is placed over ammonia and water to absorb the chlorine. 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 peroxide of hydrogen. Marignac controverts 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 Thénard, which is not volatile like ozone, but inodorous and fixed. Mr. Gann’s opinion is, that I am inclined 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, [Prazoox, 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 is evident that oxygen is the primary element 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 carbon. 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 oxygen to accrete between the oxidation or combination of the metals with the substances exhibited to them and the time when chemical action commences. According to the views of the latter, ozone must be present and of paramount importance in the processes of acclification 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 [Prazox, P. C. S.], and of course an 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 less degree than gold or platinum. The 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, being thus 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 on the nature of the point and the time the plate is exposed to the brush lasting 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 ozone. Heat, which destroys, or exposes 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.


According to Professor Schönbein, nitrogen is a combination analogous to hydrochloric acid, and is composed of ozone and hydrogen.
PACCIAROTTO, JA'COPO, one of the most distinguished of the old Sieneese painters, was born at Siena in the latter part of the fifteenth century; but though he belongs chronologically to the painters of the sixteenth century, he is one of the last of the masters of the old school; his works much resemble those of Pietro Perugino; at the same time they are more fully developed in form and of wonderful force of colouring; in expression also many of his heads are admirable.

He lived and worked for a long time as his son does now, 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 not have been hanged, had he not been protected by the Observanti monks who concealed him for some time in a tomb. He succeeded in making his escape, and joined II Rosso in France, where in all probability he spent his days, not looking forward, 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 Sieneese school—Ranzi, calls Sodoma, being the first. They are highly praised also by Lanzi. In Santa Caterina is the visit of St. Catherine of Siena to the holy of St. Agnes of Montepulciano, in which are heads 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 of the school of Perugino, is only magnifying the injustice he had already understood in having his works long reported 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—merits which have remained long unrecognized. Pacchiarotto is probably the Girolamo di Pace his father, who is casually mentioned by Vasari in speaking of Il Sodoma; they painted together in San Bernardino.

There are two beautiful small easel paintings in oil and on wood in the Pinacothek at Munich by Pacchiarotto—San Francisco d'Assisi, 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. They are among the finest pictures of the early Italian schools of painting. They were formerly in the church of San Bernardino at Siena, but were purchased about 1818 by the present King of Bavaria, Ludwig I., then prince.

(Lanzi, Storia Pittorica, &c.; Speth, Kunst in Italian, 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 negroes &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 Tierrafranca, painted in 1594, in oil on crimson damask, each thirty yards by fifty; the paintings with the arms of Spain, and St. Joseph on horseback, with 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 1621. He had been a subject of suspicion in Seville who properly painted and gilded statues—el primer no es encarna y estara bien; las estatuas; thin colour was painted over the gold. He was the first likewise who painted the figures of the Virgin of the Rosary in Seville; there are several works of both descriptions by Pacheco in Seville.

In 1600 he was appointed, together with Alonso Vasquez, 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 distemper in the palace of Don Fernando Henriquez de Ribera, third duke de Alcaza, from the story of Don Alvaro and Dona Elvira.

It was not till 1611 that he visited Toledo, Madrid and the Escorial, and saw the great works of Titian and other celebrated masters, Spanish and Italian. The sight of the excellent works of Titian, and of the altar-piece of the Virgin in 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 Alonzo Cano and Velasquez were two of his scholars, shows that his system worked with some effect. The improvement thus introduced may be termed an 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. Soult made a magazine of this convent during his occupation of Andalusia, 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 Sacclorum Judicium Franciscus Paccicos Romulanus depingebat. Seculii a judicia natali v. anno xl.

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 of a naked female of the size of life, if of any other size. It reflects the jealous morality of the Inquisition even in its portraits. Prudery 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 had a special permission. There is a Cabinet de 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 kind, and comprises the most celebrated pictures—both old and modern—and the separation of such works from the general collection is a greater evidence of subjective immorality than of objective indecency. Mr. Ford, in his "Handbook of Spain," terms this cabinet a sort of National Museum, into which were banished all decent pictures whose nudities might corrupt the purity of Madrid; where the Italian and Flemish Leda, Danaë, 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 annoyance 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 misapplied.' Both Palomino (ii. 187) and Pacheco (201) handle these delicate subjects very tenderly. Describing the celebrated Judgment of Martin de Vos, at Seville, Pacheco relates that when it was finished, ‘in an instant, without any sound or noise before it again, he would face a hurricane in the Gulf of Bremuda; the moral effect of the awful Day of Judgment was so much counter-balanced by the immoral deshabile.'

In 1633 Pacheco was in a sad case, in company with 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 Olivares, 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 Philip was compared with Alexander, and Velazquez with Apelles (C. F. S. 161). 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 praised by great artists, and very eagerly sought by publishers and men of taste; it was common in the time of Plato and of Alexander. [NICIAN, P. C. S.]. Pacheco dressed, gilded, and painted (estofo) for the duchess of Olivares, a statue, probably of Venus, which she may have wished to place in the temple of Venus de Monte allegra for 2000 reals. The work was much admired, and by none more than Eugenio Cazes, who, says Cean Bermudez, estimated the decoration at 500 duces. What this process exactly was it 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, personal and facial. The effect of such images, called Faseos, 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 museums.

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, under the patronage of the Jesuits, the Arte de la Pintura, and were indeed the authors of that part which is devoted to sacred art, and doubtless to them is due the eastern moral which characterizes Pacheco's principles of art. He is noticed above as having been one of the first to paint images properly. He published an essay partly on this subject in 1622, complaining of sculptors painting their own statues. But the generality of Doradores and Estafadores worked so badly, that such sculptors as Juan Martinez Montafies and Alonso Cane felt compelled to dress and colour their own statues. Pacheco however coloured many statues for Montafies, including the St. Jerome of the monastery of San Sprintone, Montafies generally being employed with his employer. He was also 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 Paseo, or Sagrauds, or Imaginies of the Virgin; and some images had their mistresses of the robes (Comerena Mayor) and a chamber (Comerena) where their toilet was made. The duty has, however, now devolved upon old maids; and ha quedado para vestir imagines—he 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 saints. But the court of Madrid, says Mr. Ford, paid more attention to the decorum and propriety of costume than the Spanish clergy. In the remote villages and in the mendicant convents the most ridiculous masquerades were exhibited, such as the Sevillan, with wigs and painted faces, speaking figures have only heads, feet, and arms, the bodies being mere blocks, because destined to be covered with drapery; they are called Imagines 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 Andalusian 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 wife. One of his sisters also was Miguel Cervantes.

His Arte de Pintura, en Antigüedad, y Grandezas, etc., Seville, 1649, pp. 641, a remarkably scarce book, is considered an indispensable guide by the painters of the school 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 separate parts, theory, practice, and historical. 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 Archdeacon Michael expelling Satan from Paradise, which was painted in the church of San Alberto at Seville; but this church was one of Soul's magazines. There are still at Seville an altarpiece of the Conception at San Lorenzo, two pictures of San Fernando in San Clor, a picture in San Alberto. The methodic system of Cean Bermudez to mention the locality of all the most celebrated works of the great Spanish masters, eventually cost Spain the greater portion of these works, for his Dictionary was, at the time of its publication, an encyclopaedia and 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 described by Bermudez as at Seville have now to be found; the portrait of himself is in the Spanish museum in the Louvre. Pacheco collected the poems of his friend Hernandez 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. Bermudez has printed a few in his Dictionary. (Cean Bermudez, Diccionario Historico de los mas Ilustres Profesores de los Bienes Artes en Espana.)

PACHYCORUMUS, a genus of Cephalodaid fossil fishes, from the lias of England and Wirtemberg. (Agassiz.)

PACHYCOPHAUS, a genus of fossil fishes from Shoppeny.

PACHYODON, a genus of Dimyarian Conchifera, fossil in the lias and oolites. (Strickland.)

This is the genus Cardin-eia of Agassiz, and includes part of the Unionidea of Sowerby.

PACHYPTERIS, a genus of fossil Ferns, from the oolite of Yorkshire. (Brongniart.)

PACKING-PRESS. The hydraulic press invented by Mr. Bramah, besides being used to draw piles, trees, \\n
equipment, and 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. A 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 bear without 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 of any points from that part from the axis. It follows that the resistance opposed at such a part of a section to the momentum of the pressure is inversely proportional to the square of the distance from the axis.

Therefore r representing the radius of the interior surface of the cylinder, r the whole thickness, and x any variable distance from the interior surface towards the exterior, all in inches; then \( f = \int_0^r \frac{1}{r^2} dx \), or multiplied by 2 \( \pi \), 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 \( r \), is \( r \pi \); therefore \( f \) (in pounds) denoting the force of cohesion, \( 2\pi r f \) expresses the whole resistance.

If \( f \) (in pounds) represent the force on a square inch of the interior surface, by which the pressure of the fluid tends to strain the cylinder, \( 2\pi r f \) will denote the whole strain on the same annulus; therefore, equating the strength and strain, there is obtained

\[ \frac{f}{r} = \frac{\pi}{2} \]

This value of \( f \) expresses the required thickness.

PACO. [Llama, P. C.]
talent of every kind. In 1813 he performed at Milan; five years after, at Turin; and subsequently at Florence and Naples. In 1818 and 1819 Luigi Sanifici, the violinist and composer, Mayseder, asked him how he produced such new effects. His reply was characteristic of a selfish mind—"Chacun a ses secrets." In that capital he was accused of having injured the health of his ever having been married, which could not be produced. Then he was charged with having polargarded his mistress. This he also publicly refuted. The fact is that he knew better how to make music with friends who were captivated 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 operas; the second time, when in a boat with some friends, a turkey stuffed with trifles (un disole ours trifles), provided for our dinner, tumbled into the water; and, thirdly, on hearing Paganini for the first time.' The public of Brussels, however, were moved in a very different manner. According to M. Fétis, Paganini's performance at a concert given by him in that city, produced only laughter, which was increased during the whole of it. He arrived in England in 1831, and immediately announced a concert at the Italian Opera-House, at a price which, if accorded to any other artist, would have yielded large profits. He was to sail for the Continent, of the gulf of the British public, of the wealth of the aristocratic classes, and of their lavish expenditure on foreign performers; but the attempt was too audacious, for even these, and he was compelled to abate his demand, 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 benefits, always taking at these a large proportion 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 1834, 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 (glottis laryngis). By his will, dated 1837, he gave his two 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 francs, divided among them. Thebes and other facts before related, we give on the authority of the Biographie Universelle.

Paganini certainly was a man of genius and a great performer, but scorching to his bones, and the violin was almost marvellous, though he made an ignoble use of his power by employing it to captivate the mob of pretended amateurs by facts little better than sleight-of-hand. His performances, as well as the effect of his刘al, were so grand, that the harmonics, were very extraordinary; but why, as was asked at the time, he 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 strain 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 argument 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 practice of not uncommon acts of violence in the Spring 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, Supplement : Harmonicon.)

PAGGI, GIROLAMO, proceeded to Genoa in 1554, was the pupil of Luca Cambiaso, and was distinguished chiefly as a painter, but he was also a sculptor and architect. About the year 1600 he was occupied with an expedition to search for the treasure of an unfortunate homicide which the absurd conduct of a friend brought upon him. Paggi went to Florence, and, under the protection of the grand-dukes Francesco I. and Ferdinando, they were both proceeded to, until he was recalled through Archbishop Sinismitus, afterwards
PAUL AUGUSTIN, a distinguished French sculptor, was born at Paris in 1730, and was the pupil of J. B. Le Moine, likewise a sculptor of excellence. Paou obtained the grand prize for sculpture in the French Academy, in 1748, and accordingly was sent as a pensioner of the French government to Rome, where he remained twelve years. Gabet mentions that Paou was the sculptor of about two hundred works, in bronze, marble, stone, wood, and even in paper or pastebord; and he gives a list of some of those which he ex- hibited. In 1769 he exhibited a sketch of the tomb of Sis- nius, King of Poland, and father-in-law of Louis V.; a statue of the Duchess of Mag- marin, representing Love as ruler of the elements; and four large colossal figures in stone for the garden of the Palais-Royal, representing Mars, Prudence, Liberalty, and Apollo. The present article is directed particularly to the works of the sculptor, and the connection in the history of his life is chiefly the report of the Academy, of the Luxembourg; and of the Cathedral of Orleans, and the Palais Royal. The sculptor of the façade of the Palais-Royal, ordered by Louis XVI. He executed also the sculptures of the Salle de l'École des Fils, of the Palais Bourbon; and of the Cathedral of Orleans, and also the Naïades of the south and west faces of the Fontaine de l' Innocent. 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 British Museum; and of the British Institution. He was natural his- torically, and was so far the exponent of his own character. His son Jacques Augustin Paou was a painter of great merit. (Gabet, Dictionnaire des Artistes de l'École Française, &c.)

PALEOGRAPHY (from Gr. palaios, 'old,' and graphe, '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 comparatively 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 the class of its characters in part by its state and texture, but cannot with any strict elucidation. The present article is directed particularly to the ornament and general illumination of ancient MSS., and their connection with the progress of painting, and the taste and theory of the writer; or to the study of MSS. literature, which is treated of in the 'Penny Cyclopedia.' 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 Silvaste (Paléographie Universelle, Collection de Fac-Similes d'Écritures de tous les Peuples et de tous les Temps, par M. Silvaste, 1839-42, 4 vol.)

The first work which treats of this subject with regard to ornament is D'feldin's Bibliographie Decamerorum, published in 1817, which was followed by the more comprehensive work of D'Agincourt, History of the Manuscripts of the Italian School, but which treats chiefly of Greek and Italian MSS., and the illustrations are uncoloured. D'Agincourt was the first to proungulate the treasures of the Vatican Library in this depart- ment, and it was one of his most beautiful works. The life of Mr. Shaw, on this subject was published in London, in 1833, Illuminated Ornaments selected from MSS. and early Printed Books, from the Sixth to the Seventeenth Century, drawn and engraved, with descriptive notices, by Sir F. Morden, keeper of the MSS. in the British Museum. There are many papers on this subject in the Archæologia; and a series of articles on the Progress of the Art of Illumination in various countries, with fac-similes of manuscripts, was published 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 any importance from the third century of the Christian era. Portraits were sometimes prefixed to the writings of authors: Martial (ix. 186) mentions one of Virgil which was prefixed to a MS. of his works; and Virgil himself, in the Eclogues, lines 835, 836, mentions the portraits of 700 distinguished men in his writings, and dis- persed them over all parts of the world.

The illuminating of MSS. is generally considered as a con- necting link between the art of the miniaturist, and the art of the painter. At the revival of painting MSS. were illuminated by painters, the calligraphists must have been always a distinct class, and even the initial letters and borders were executed by distinct persons. But it is evident 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 revival of painting became subsequently 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 are few even moderately good miniatures as works of art to be found in any MSS., and the best of all are those executed by the celebrated Melimg and his nearly contemporary Giulio Clovio, a native of Croix, who died 1578, aged eighty: executed therefore at a period when the art of painting was at its highest state of perfection, which shows that the influence of the great works which Flanders and Italy then sounded reached the decoration of MSS. as well as other objects of taste, the less influenced by the great masters. But it is plain that it would be difficult to show that painting was ever in any way improved or even preserved by the illumination of MSS. The miniaturist (from minium or minito, red lead; Jinty and Vitruvius sometimes mean vermilion) has always to have been the only painters of the middle ages, but this is an incorrect assumption, and that the miniaturist also were the revivers of painting in the tenth and eleventh centuries is a theory founded on assumption. Constantinople always had its painters, and there is a Latin work extant, of as early a date probably as the ninth century, which treats of painting and of the MSS. of that time, 'De Scriptoribus et Artistis pingendi,' not omitting painting in oil. There is a MS. of this work now in the British Museum; it is by Theophilus Presbyter, whom Leasimg supposed to be the same person as Tutilo or Tuttilo, a monk and painter, 'picture artist,' of the convent of St. Gall, in Switzerland. The work is printed in Leasimg's Beiträge zur Geschichte und Literatur, No. vi., Brunswick, 1781. (Tuttilo, P. C.)

Vinci, 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 de'Angeli, of the fourteenth century, as the most of the MSS. were done by them, though it cannot be said to have been 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 such that with two other MSS. of his the brother and the right hands were embalmed after their death and preserved in a tabernacle.

It appears that the earliest MSS. extant 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 commencements of books. No ornaments have been found in the Herculaneum papyri. The Egyptian papyri are written in various colours; they contain mythological 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 the Monuments of the Early Church of the East, and notices 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: among figures, the miniature Virgil, in one of the Rossa, vol. ii. pt. 2, p. 945-363);--Of the Western or Latin MSS. the earliest is probably the Virgil (Vatican, No. 225), containing 50 miniatures, 44 of which are from the Aureliana, and in the introduction of which is an epigram by Sir F. Morden, keeper of the MSS. in the British Museum. There are many papers on this subject in the Archæologia; and a series of articles on the Progress of the Art of Illumination in various countries, with fac-similes of manuscripts, was published 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. Another MS. with MS. 160 is also in the possession of Cardinal Bembo. At the commencement of the MS. is a portrait of Terence, and at the beginning of each comedy is a picture of masks: in the text are representations of more important literary characters attached. This MS. is supposed to be of the ninth century; and the illustrations are thought to be copies of earlier works, on account of the superiority of the designs to the more primitive ones in the figures; the drawing is very bad. (D'Agincourt, pl. xxx., xxxvi.)

The writer of the MS. was Hrodgarius (Rodgar), from his name apparently a German. There is another Virgil in this collection which is signed with the name of Pantaleon, (Vatican, No. 630), and is dated in 1085, and distinguished for its writing, initial letters, and arabesque marginal decorations; it contains only one miniature—the author writing. A still more remarkable MS. is the MS. 92, also in the Panoplia, fortifications against heresies (Vatican, No. 666), executed by order of the Emperor Alexius Comnenus (1081—1118). In this MS. are three large illustrations on gold ground: the two, representing the two sons of the same leaf—on one the fathers the Greek church are bringing the materials of the book, and on the other, the emperor is receiving them; above is an apostrophe of the Saviour, with the dieties of the same period in 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 ancient costume. (D'Agincourt, pl. lxi.)

There is also a beautiful MS. of the four gospels, or Evangelium, executed in 1128, in the reign of Johannes Comnenus. The illustrations of this MS. are—Christ seated between Justice and Love, and another Christ crowned; but the third one which he has with his right hand the emperor, with his left the emperor's son Alexius; the Evangelists writing; the birth of the Saviour; his baptism; the birth of John the Baptist; and others. Of this MS. is also a MS. dates from the ninth century. The vegetable characters are large: the leaves are picked out with gold, 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 ancient costume. (D'Agincourt, pl. lxi.)

The Byzantine MSS., of which there are many in the Vatican, are generally divided into two classes: one, the works are well executed, but the horses and the human figures, particularly, are bad. (D'Agincourt, pl. lxxxiii.)

The Byzantine MSS., of which there are many in the Vatican, illustrates the style of the early Christian illustrations: in the Byzantine they are very inferior to the earlier Christian illustrations: in the extremites they all have the same characteristic imperfections of Byzantine art, but in treatment, in costume, and in the manner of treatment, they appear to be modern substitutes. (Jongmans, lvi., and Ai, and Montfaucon, pl. xxxv.)

These MSS. are also the celebrated Monologium (Vatican, No. 1618), or part of a Greek Calendar, from September to February, with 450 miniatures upon gold ground, illustrating the life of Christ, and of all the saints whose holiday occurs in these months of the year. The miniatures, according to names inscribed upon them, were painted by Pantaleon, Simeon, Michael Blachernitas, Georgius, Menas, Simeon Blachernitas, Michael Micros, and Nestor. They are extremely poor in execution, 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 general merit is the subject represented in the lives of the saints. There are many characteristic Byzantine buildings introduced in the background. This MS. was executed by the order of the Emperor Basilus II., called Feodoricus, finished by Eustathius, and have been procured from Constantiopol by Lodovico Sforza, Duke of Milan. It was presented to Paul V. by Cardinal Sfondrato, and placed in the Vatican Library in 1615. Cardinal Ambrì-

The manuscript is written on vellum, in black letters, together with a Latin translation, but the engravings of this edition are very inferior to the originals. (D'Agincourt, pl. xxxi.—xxxiii.)

The rest of the Calendar was supplied from a MS. in the Library of Grotta Ferrata, in which there are no illustrations.

Platner is of opinion that the best Greek MSS. are those of the period of the Comnenus emperors (1056—1382), in both the monasteries of Constantinople and of the Crusaders; and particularly during the reigns of Alexius I., Johannes II., and Manuel I., and this opinion is borne out by the illustrations of D'Agincourt. Of these MSS., the Homilies of Gregory Nazianzen (Vatican, No. 468), dated in 1069, and distinguished for its writing, initial letters, and arabesque marginal decorations; it contains only one miniature—the author writing. A still more remarkable MS. is the MS. 92, also in the Panoplia, fortifications against heresies (Vatican, No. 666), executed by order of the Emperor Alexius Comnenus (1081—1118). In this MS. are three large illustrations on gold ground: the two, representing the two sons of the same leaf—on one the fathers the Greek church are bringing the materials of the book, and on the other, the emperor is receiving them; above is an apostrophe of the Saviour, with the dieties of the same period in 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 ancient costume. (D'Agincourt, pl. lxi.)

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or Attavante, a celebrated miniature painter, also executed miniatures for Matthias Corvinus, but Vasari adds that all the MSS. for the duke Federigo between the years 1460 and 1482, the last is that of his death, and 1476 is the year in which he was presented with the order of the Garter by Edward IV. The decoration of this order is embellished with the figures of the sovereign and the three parts. (D'Agnicourt, pl. ixxvii.) Of the sixteenth century there are, with the exception of Giulio Clovio's and Memling's, scarcely any MSS. worthy of the time, and those of Clovio are put to an escape from such 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 guesso, or a colaf the lights are relieved in white, gold, and silver. The design is in both cases previously put in fine outline. In the sixteenth century Vasari, spent nine years in painting the twenty-six miniatures in the MS. in the Library at Milan, dedicated to 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, who 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 extant: the excellency of his oil paintings; they are painted in body colours and 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 on Ghent and Livin of Antwerp, is the celebrated missal of Cardinal Grimani in the Library of St. Mark at Venice (it is described in the Kunstblatt of 1833); Memling died considerably advanced in age in the beginning of the sixteenth century. (Memling, P. C. S.) There were also several good miniatures or miniaturists 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:

Oderigi died about 1300, Franco was still living in 1313. Simone Memmi, the pupil of Laura, and the friend of Petrarch, was likewise an illuminator of MSS. There is a MS. of Virgil in the Biblioteca Comunale at Gubbio, which was executed 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, who 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 extant: the excellency of his oil paintings; they are painted in body colours and 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 on Ghent and Livin of Antwerp, is the celebrated missal of Cardinal Grimani in the Library of St. Mark at Venice (it is described in the Kunstblatt of 1833); Memling died considerably advanced in age in the beginning of the sixteenth century. (Memling, P. C. S.) There were also several good miniatures or miniaturists 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:

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The most beautiful MSS. of the eighth, ninth, and tenth centuries are those in England, and especially in the tenth century. 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 of the 11th century, called writing, which is 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 again, especially in the Bibles and Pentecostals. With these altogether in the 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 since these respects been surpassed. These letters are ornamented with all kinds of fanciful figures, composed of men, animals, birds, fish, and flowers. Montfaucon, in his 'Palaeographia,' gives a complete alphabet from MSS. of the ninth and tenth centuries. He states that the capital letters are taken from the story of the text, Lettres Histoire; they occur most frequently in the Franco-Gallic MSS. In this alphabet a T is represented by a fox, and a B by a pomegranate; in its mouth horizontally, from the ends of which hang very rare objects. Charlemagne and his grandson Charles the Bald were great patrons of illuminations. Charlemagne's Bible in the Schuyler manuscript is one of the most splendid and the best example of ornamental calligraphy extant. There is another very inferiorly 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 Charles 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 Spyvee-Passeval, who had bought it for the sum of 750 francs. The N.B. is of the large amount, for the comparatively small sum of 750 francs, he asked the trustees of the Museum originally 12,000 francs. The twelfth century is remarkable, says Sir F. Madden, for profusion of ornament and a graceful but intricate mode of illuminating capital letters, which renders it more easy to appreciate MSS. of this period than any other. See specimens in Shaw's 'Illuminated Ornaments,' &c., pl. ix. — xiv., 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 used, and the initial letters more elaborate; though the inferior effect is that 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 'Hagiography,' and totally unilluminated. In the 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 spiral scroll work, which extend along the upper and lower margin of the page, and support small groups or single figures of dogs, hares, apes, &c. much resembling the decorative etchings and woodcuts which have recently appeared in Germany, and also occasionally in England. A Psalter of Lord Braybrookes has beautiful examples of this style of decoration (Shaw's Illuminated Ornaments, &c., pl. xvi., xxi.). English illuminators were in no way behind their continental brethren, and the greatest manuscript extant on the Continent at the same period is the Benedictional of St. Ethelwold, belonging to the Duke of Devonshire, written and illuminated between 963 and 970, is the most complete example of the fourteenth century. This MS. contains the Life and Times of St. Ethelwold (then the most celebrated place in England for such works), named Godman, for Ethelwold, bishop of Winchester. It is a folio of 119 leaves of vellum, measuring 11½ inches in height and width, and contains 278 leaves with border and initial drawings; and it is considered the most valuable MS. of the Cavendish collection. See Mr. Gage's 'Dissertation on the St. Ethelwold Benedictional,' in the Archaeologia (vol. xxiv., p. 25), where all the illustrations are engraved. Another curious MS. of this time, now in the British Museum (Cott. MSS. Claudius B. iv.), is a remarkable MS. of the Anglo-Saxon period, and contains 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. The initials A. vi. is a remarkable MS. of the Anglo-Saxon period, drawn from the Charter of King Edgar to the new minster, 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 that period. It is of the eleventh century. No. 608 of the Harleian MS. contains a long series of illuminations of Anglo-Saxon customs, in very curious designs in outline, executed in various coloured inks; and though the execution is ridiculously slow, the subjects are many and various, and the execution of great beauty. In the Cott. MSS. Cleopatra C. viii. of the same period there is a comparatively very superior drawing of a party at meat 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 Saxo-English 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 the latter part of the thirteenth century, more probably of a later date, purchased by Lord Jerningham (Reg. MSS. 119, v. b. vii.), in which the drawing of the period is much better represented than in MSS. generally: some of the illuminations are in the character of the fifth part of the Italian frescoes of the fourteenth century, but it is evident that the illuminations of MSS. at all correspond in design with the highest state of the arts of their time. It is an English Psalter, and there are also fifty-six illuminations 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 washed in. These are 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 however intended for the use of the laity, and richly ornamented with designs, many illustrating the history and habits of the time. This book was presented to Queen Mary in 1558, by her then pensioner, Dalby Smith. There are some French MSS. of the same period in which the illustrations are equally good, as the 'Life of St. Grat' and 'Les Gestes des Roys de France,' both folio volumes, with numerous illuminations. On the last page of the second is written 'C'est livre est a moy Houfrey Duc de Gloonestrue du don de l'executore de Sr. de Fance.' There is also a French MS., called the Metrical History of the Life of Richard II., preserved in the British Museum, with a series of finely illuminated illustrations. It is translated in the 'Archaeologia,' vol. iii., p. 270, by the Rev. John Webb. There are three cuts from these MSS. in the volume of the Penny Magazine already noticed.

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 Tobin 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, with 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 Lapin's 'History of England,' was taken from the illumination, in which 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 knight is his arms, and beneath are the words, 'presented by the Duke of Bedford to Henry VI., at the coronation in France: after passing into various hands, it was several times sold by public auction, and was last bought by Sir John Tobin, at Liverpool.'

There are also in the British Museum many illuminated French romances of the fifteenth century, which are particularly interesting as regards costume. Among the most attractive of these are two illuminated books, one of which is the Historie des Amours de Perceval (MSS. 4425), the collection presented by Talbot Earl of Shrewsbury to Margaret of Anjou (Royal MSS., 16 E. I.), and the poems of Christine de Pisan (Hali. 4431), while the festa of arms and chivalry, by the same author, is still preserved.
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 illuminating in the two countries at this time. The "Mansion of Personages," given in both, consists of similar figures; it is supposed to have been executed towards the close of the fifteenth century; it is a folio volume, measuring 16 inches high by 113/4 inches wide, and contains 185 leaves, illuminated in double columns, the initial letter of every paragraph being illuminated. This French poem is of the thirteenth century; it is a dream, and was commenced by William de Lorris and finished by his son, the composition 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 French. (Dibdin, Bibliographical Documen.)

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 the small dotted line or point at the edge of the larger letters. The Lombardic and Insular letters are tessellated and embossed. There are no British illuminations later than the reign of Henry VIII., 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 sixteenth century; and then a system of bookbinding was adopted, like that of the present day, and a bonne livre, compared with that of printed books, must naturally have so limited the demand, that they 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 equalled the manuscript characters in beauty, and they have perhaps not even been surpassed in equality of execution and finish. See the fac-similes in Sylvestre's Palaeographie Universelle. Perhaps the latest, says Sir F. Madden, or one of the latest illuminated missals, is the famous folio in the library of Rosen, which is nearly three feet high, and cost the monk of St. Andoche, who illuminated it, thirty years of labour: it was completed in 1682.

PALEOZOA/MIA, a genus of fossil Cycadean plants, from the oolithic and lias deposits of Yorkshire, Dorsetshire, and Oxfordshire.

PALAQUEIN (sometimes written Palanqueen, Palanquin, and Palacke), a kind of covered litter carried, by means of poles, upon the shoulders of men, which forms the principal conveyance of many Oriental states. A very minute description of an ordinary palanquin, together with an amusing account of a däkk or dëkk journey, which is the name given to the mode of travelling long distances by the palanquin, is given in Captain Collingwood's Voyages and Travels, 3rd 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 at 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 shelf or book, a neat cover of the same and other loose articles and books for hats, towels, &c. 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 case-bottomed chair, and is covered with a light elastic mattress stuffed with horse-hair or shavings produced in dressing the bamboo and rattan. Across the palanquin, about eighteen inches from the hinder end, is a broad bar with two narrow bars to rest against when sitting up, and towards the other end is a movable bar against which the feet may be placed as against the stretchers in a boat, which may be shifted nearer to or farther from the body by raising or lowering the palanquin, according to the length of the traveller's legs or his choice of position. In the space behind the back-cushion the bed-clothes and pillow are stowed away during the day; and the shoes, drawers, and nets afford facilities for the conveyance of teapots, canisters, shaving apparatus, scientific instruments, sketching materials, and a variety of personal necessaries. The porter is supposed to be a native of the place to which he is going, and to be privy to the best way to go, and to the safest, which is the most convenient road. The porter is often a person of business, and is usually to be seen accompanying the traveller be separated for a time from his heavy baggage. Articles may be laid beneath the mattress, and bottles and food placed in pockets attached to the corners 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 so as completely to envelop the palanquin, in rainy weather. A covered sedan-chair is generally in use. A palanquin is attached to each end of the palanquin, near the top, to carry it by; and to the foremost of these poles is suspended a rattan basket containing a water pitcher, or goglet, of porous earthenware; and also the water which exudes 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 alcarazas of Spain, described under Coola, P.C., p. 495. 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 däkk travelling in the 'Narrative of a Journey through the Upper Provinces of India,' published in 1826, says that his palanquin motion is 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 a map of the country; which, it should be observed, is a great part of the country that 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 bear part of the weight. (Pall, 1st ed., p. 202.)

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 exasperatingly unpleasant to Venice. With a little care, 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 expressing 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 Palæstra, or state palæon 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.' (Burgess's Cyclopaedia.)

PALECHI/KUS, a genus of fossil Echinodermata, from the mountain-limestone of Ireland. (Scouler.)

PALS REGIA, a name occasionally applied to the village of Palestania, in the county of Galilee, where John the Baptist is said to have been born. It is generally supposed to be the same as the village of Rabbah, not far from the sea of Galilee. This village is well watered, and was esteemed a pleasant place, though it was not so flourishing as it once was. It was mentioned by Josephus, and by the early Fathers of the Church, and was the residence of a bishop. The village was visited by Cardinal Cullen in 1646, who ordered the bells to be struck thrice a day, in memory of the visit of St. Paul, when finding that Palestina 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 held for three years (1568–71), during which time he married Maria Maggiori; and in 1571 was restored to his post in the Vatican. Up to the year 1569 he composed many works for the church, among which Baini especially mentions three Graduals and six Properies published the same year by Dr. Burney, in his collection of music performed in the Capella Pontificia, it seems to us that these many-extolled compositions, consisting of the simplest counterpoint, must own their effect to place and high-wrought feelings.

During the above period, however, the Council of Trent, among other matters, took the state of ecclesiastical music into serious consideration, and appointed two cardinals whom 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 irritationally defended the melodies, and contended for the florid and elaborate. At length it was agreed that the cardinals should have the choice of three masses, 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 enthralling pitch. On his return from the service Dr. Fordwad, Domini, illumina occulos meos. The pope, 'before whose presence the work had been performed, was enraptured, and compared it to the heavenly melodies which the apostle John heard in his ecstasie trance.' By this one great example the question was now forever set at rest," says Ranke (in his 'History of the Popes,' acknowledging Baini 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. Not only were the spiritual attributes of the mass, its Spiritual sanctity and rapture were the favourite themes of poetry and painting. Music, which speaks a language more direct, more impressive, more adapted to ideal expression, than that of poetry, was here at its best. The picturesque, the imaginative, and thus subjugated all minds to her empire.' (Mrs. Austin's translation of Ranke, vol. i.) We here again find the warm expressions of an enthusiast, no doubt; but it must be borne in mind that the writer heard these compositions performed under peculiar circumstances of a very influencing nature—under the roof of the grandest temple in the world, with every advantage that the finest execution, a solemn unceasing for imposing effect, and the most exciting religious associations could bestow.

On the restoration of Palestrina to his office, his fame spread widely. Cardinal Faccio announced to him that Palestrina was restored, and, of his own accord, the composer that he might dedicate himself to his. To his other appointments was now added that of Maestro to the congregation of the Oratory. He also undertook the direction of the Palestrina school for the young churchmen. 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—a duty performed by his successor, Cardinal Borromeo. However, his personal circumstances must have been much improved, for on his death-bed, after blessing his son, he added, 'I leave many unpublished works, and thanks to the Abbé de Baumé, the collection of his works is placed in the hands of that gentleman.' In January, 1594, it became evident that his life was rapidly drawing to a close; and on the 2nd 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, Terrizio (Grotte Vaticane, ii. 166) says, 'In St. Peter's church, near the altar of St. Simon and St. Jude, was interred, in consequence of a contract with the Cardinal, PUllin, of Palestrina, the great musical composer, and Maestro di Cappe- lia of this church. His funeral was attended by all the musicians of Rome, and 'Libera me, Domine,' as composed by his own hand, was sung. After being placed in the same church—when read in the kind of place for which it is adapted, and attended by pomp and pageantry, it strongly felt by all, and acts with irresistible force on sensitive minds. But in the concert-room or chamber, his composition, whether sacred or secular, bare, with few exceptions, no charms for hearers who have not cultivated a taste for simple, solid, airless harmony, or for the intricacies of fugal 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. Cleres 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 learned and all-acclaimed Dr. Gardel, to which the English version of the 16th century was added. In Pope Clement's words, 'We have heard with our ears,' and third, 'Not unto us,' are printed in Dr. Arnold's Collection of Catholic Music, the second volume in its original state in Hawkins's History of Music, iii. 175. Of his motets was one in the Missa Transalpina (1588), a work containing twenty madrigals by Italian masters; and this is the only composition of Palestrina noticed in La Musica Magistrale (1687); an elegant, interesting volume, containing the words of 365 compositions, chiefly madrigals, 'of the Elizabethan age,' together with many translations from the Italian, and much curious matter. In his Saggio di Contrappunto, he has given two madrigals, and then aaria da gamba, 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 that style now distinguished by his cognomen—by the term alta Palestrina.'

(Baini, Vita di G. P. da Palestrina; Burney, iii. 188; Horatianicus, x. 71.)

PALL. [SAMEY, LANGUAGE AND LITERATURE, F. C.]

PALICOURIEA, a genus of plants belonging to the natural order Cinchonacea. The limb of the calyx is 5-toothed or 5 lobed, or nearly entire; the corolla tubular and cymose, with deeply cleft limb, and a little hair beneath the base. The petals are white, and the corolla sometimes rather unequal. The species are American shrubs wholly destitute of pubescence. The leaves are often simple or 3 parted and of a saffron-coloured. The flowers are white in terminal sessile or stalked panicles, thyrses, or cysses. P. Marcropetali is a shrub from 5 to 6 feet high, and has smooth quadrangular branches. The leaves are short-stalked, oblong, acuminate, obsolete at the base, smooth; the stipules are deciduous and triquetrous. The calyx is 5-toothed and downy; the corolla from 5 to 7 lines long, slightly curved, gibbous at the base, roughly 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. crocra has a smooth stem, ovate or oval lanceolate leaves. The flowers are of a pink rose, often double, the petals arching over the base, side linear, acuminate, twice as long as the petiole. The panicle is corymbose, terminal, and suffron-coloured. The calyx is oblomical and tubular, the anthers projecting from the tube. The fruit is a globose capsule. It is an annual. It is natural to Porto Rico, Trinidad, Cuba, and Gra
daloupe. According to Von Marlies this species is evergreen. P. speciosa has smooth round branches, oblong acuminate leaves, an orange are ovate at the base, minutely pubescent, often double, the petals are stalked, their angular branches and corolla hairy and downy. The leaves have by their yellow colour obtained for the plant the name of Gold- shrub, highly prized in Brazil and the West Indies for 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." (Martius.)
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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 mucron tapering a little at the base. The flowers hang in terminal panicles. It is native of Brazil, and is reported to be a powerful diuretic, and is used both in human and veterinary medicine. 

Other species of this genus are said to have qualities similar to P. officinalis, such as P. latifolia and P. longifolia, which are mentioned for possessing medicinal virtues. 


P. lactuca is a genus of plants belonging to the natural order Rhamnaceae. It has a spreading 5-cleft calyx, 5 obvolute convolute petals, 5 protruding stamens, ovate 2-celled anthers, and a flat pentagonal disk. The fruit is dry and indeshiscent, expanding in a membranous ring, containing a 3-celled nut. The species are shrubs or trees, with alternate simple leaves. 

P. aculeatus, Christ's Thorn, is a very common plant in Palestine, and on the borders of the Mediterranean Sea. It has pubescent horseless ovate serrated leaves, quite smooth, 3- or 4-cleft petaloid spines at their base, erect, more or less hooked. The flowers are of a greenish-yellow colour. The fruit has a very singular appearance, resembling a head with a broad-brimmed hat on: the French call the tree 'Fortin Chardon' from which it grows. There is a tradition that this is the plant from which the crown of thorns was made which was placed on the head of our Saviour. 

Bauhussiut is however of opinion that it was rather the Zizephus spinos Christi. This species of Paliurus is one of the most common thorns in the hedgerows of Asia, and its flexible spiny branches form an impassable kind of fence. The seeds are sold in the herb-shops of Constantinople, and the native doctors prescribe them in many complaints under the name of the Aegean. They are also used as a dye. There are two or three other species of this genus, which are handsome shrubs, and well fitted for shrubbery. They will grow in any common soil, and may be propagated either by layers, cuttings, or seed. 

(Don, Gardener's Dictionary; Burnett, Elements of Botany.) 

PALLADIUS, a Roman writer on agriculture, whose complete name is Palladius Rutillus Taurus Eumilianus. The place of his birth and his period are uncertain, but it is probable that he lived about the time of Valentinian and Theodosius. He is author of an extant work entitled 'De Re Rustica' in fourteen books. The first book contains general rules about agriculture; the twelve following books are respectively devoted to the agricultural labours of each month; the fourteenth book is an elegant verse treatise of grafting trees. The work of Palladius is the only one of this kind that was annotated by previous writers, such as Columella and Martianus Gargilius, whose work on agriculture and garden cultivation is lost. The 'De Re Rustica' of Palladius was an inspiration to a later work. The work of Palladius, 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. 

Palladius and the other Roman writers on Agriculture are contained in the edition of the 'Scriptores Rei Rusticae' by J. M. Geiger, Leipzig, 1755, and in the improved edition of the same work by Ernesti, 1773. The latest edition and the best is by J. G. Schneider, Leipzig, 1794-7, 4 vols. 8vo. 

(Bubh, Geschichte der Romanschen Literatur.) 

PALMA, one of the Canaries, is situated between 28° 29' and 28° 56' north latitude, and 17° 39' to 27° 45' west longitude. From north to south it extends about 26 miles, and from east to west about 16 miles in the widest part. The average width is about 14 miles. This gives a surface of 364 square miles, corresponding to 554 square miles. 

The island is one mass of volcanic rocks. The shores are rocky and steep, and generally rise to a considerable elevation from the shore; the country rises in terraces towards the interior. The highest point of the island is in the middle of the northern portion of the island is an immense crater, the Caldera de Tahriuriente, which is seven miles in diameter; the bottom of it is 2406 feet above the sea-level. 

It is surrounded by steep masses of rocks, which rise 4000 feet above its bottom. In its vicinity are the highest summits of the island, the Pico, the Muchachos, which attains 7712 feet, the Pico de Sta. Cruz, which is 7649 feet, and the Pico del Cedro, which rises to 7292 feet above the sea-level. Further southward the mountains decrease in elevation. The Pico de la Lavanda, situated nearly in the centre of the island, is 4536 feet above the sea. Towards the southern extremity the heights are much lower. These rocky masses are split by very deep fissures, and broken bottom are frequently 500 feet below the adjacent masses, and the sides very steeple. They are most frequent in the high mountains which surround the Caldera, around which they are disposed in concentric rings. These rocky slides are often covered by a mixture with the crater, with the exception of the Baranca de Angustias, on the west side of the island, which originates in a crater itself, and descends to the sea, and in which the only river runs which has water all the year round. It waters the Las 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 contains 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 spots where they are cultivated with success, and where a great degree of fertility; but with the exception of the Llanos, 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 give protection, which covers a considerable 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 to the livestock. The rainy season is from January to May, and the dry season from June to December. The climate of the island, without the consideration of its southern parts, is so mild that it is compared with the spring in southern Europe. Earthquakes are not rare, and two volcanic eruptions in the southern districts, in 1586 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 helicco (Phrys aquilina), which grows wild on the small hills in the calderas. It is mixed with flour, or even used alone for making bread, which is especially good, and is said by Von Buch to constitute the principal article of food for two-thirds of the inhabitants. The cane is still grown in the Llanos, but the cultivation is much diminished, and some years ago it was said that the cane did not exceed 1000 tons. In the town of Havanna one plantation produced 30,000 arboles. It appears that more silk is produced in Palma than on any other of the Canaries. The vineyards are extensive, and wine is exported; the surplus is converted into brandy, which goes to the Spanish colonies in America. The fruit-trees which are found in the orchards are the same as those mentioned in Teneriffe, P.C., vol. xiv., p. 204. Few horses, mules, and asses are kept. Cattle are rather numerous, but neglected; sheep and goats are kept in great number, especially in the vicinity of the Caldera. The number of hogs is small. The population amounts to 20,878 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 very industrious. The chief industry is the raising of poultry, and the raising of cereals. Many people live in straw huts, and subsist for two-thirds of the year on the black bread made of the helicco. But they are very industrious. In the Llanos there are 236 silk-rooms, in which silkworms, silkworms, silk ribs, and other parts of the work are done. They export some coarse cotton and Woolen cloth. In two or three places tiles and terracewar are made. 

Palma is not visited by foreign vessels. Some vessels from Teneriffe trade with the island, and deliver the ballast, consisting of sugar, almonds, fruits, deals and timber, pitch, charcoal, raw and manufactured silk, brandy, and orchilis. They import European goods, oil, grain and potatoes, saltfish and sugar. 

Palma has several ports: Epinolida, Santo Domingo, 


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Only the last mentioned,
Tazarote, Naos, and Santa Cruz.
which is on the eastern shores of the island, is visited by
The town of Santa Cruz de la Palma consists of two
vessels.
streets running parallel to the shores from north to south,
and many isolated houses built on the steep declivities of the
rucks.
It contains one church and four convents, and a good

The
The

from 10 to 16 fathoms
population, including that of some hamlets in
of water.
the neighbourhood, amounts to 6000 individuals.
In the thirIt is uncertain when Palma was discovered.
teenth century it appears to have been visited, like the other
It was taken possession of by the
Canaries, by the Genoese.
Spaniards in 1492, under the command of Don Alonzo Fernandez dc Logo, and has since that time remained in * their
hospital.

anchorage

is

good

in

possession.

(Von Buch's

Physikalische Beschreibung der Canarisclien
Gregor's Canaruche lutein nach iltrem
gegenwartigen Zustande.
PALMA'CEJE. [Palms, P. C.l
a genus of fossil plants, from the coal
(Sternberg.)
formation.
PALMARO'LI, PIETRO, a painter and celebrated
picture restorer, who was the first to transfer frescoes from
the wall to canvas. The first work so transferred was the
Descent from the Cross by Daniele da Volterra, in the church
of Trinity do' Monti, in 1811 : it is still in this church, but
not in the chapel in which it was originally painted. The
successful transfer of this picture caused a great sensation at
Rome and in other parts of Italy, where such transfers were
and still are repeatedly practised with success : the process
Palmaroh transis described in the article Fbesco, P. C. S.
ferred and restored many celebrated works in Rome and in
Dresden, and among those in the latter city the celebrated
Madonna di San Sisto by Raphael was restored by him. Palmaroli has done great service as a restorer : he freed in 1 816 the
celebrated fresco of the Sibyls, painted by Raphael for Agostino
Chigi in the church of Santa Maria della Pace, from the destructive restorations in oil which were made by order of Alexander VII. Although some restorations were necessary and
are evident in this work, the lovers of art are highly indebted
to Palmaroli ; for, before his undertaking, this celebrated
fresco was a subject of general disappointment to the admirers
of Raphael, and was indeed so dark that the objects were
scarcely distinguishable.
He died at Rome in 1828.
(Platner, Beschreibung der Stadt Bom, vol. iii. pt. 3, p.
385 ; Kunstblatt, 1837 ; Nagler, Neues Altgemeines Kiitutler
Lexicon.)
(intended to be formed from »Sv, all, and ojcos,
a remedy), a genus of plants belonging to the natural order
Araliaceae.
The flowers are polygamous, the calyx obsolete
and 5-toothcd. It has 5 petals, 5 stamens inserted with the
petals under the edge of the disk, and alternate with them.
The fruit is succulent, compressed, orbicular, from 2 to 3
celled ; the cells leathery and one-seeded.
The species are
herbs and shrubs and trees, having the leaves and infloresInseln, and

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PALMACITES,

PANAX

cence variable.

China and Cochin- China as
It has a shrubby
unarmed stem, pinnately decompound leaves petiolate oval
P.jruticosum

is

also used in

a febrifuge, and as an astringent tonic.

;

oblong leaflets coarsely and dentately serrated, the ultimate
ones deeply trifid, the panicle corymbose, with the branches
It is a native of the islands of
umbelliferous at the apex.
Ternate, Java, and Amboyna.
The hardy species of this genus grow best in peat, and are
propagated by dividing at the root. The other species flourish
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
Burnett's Outlines of Botany.)

PANVI'NIO, ONU'FRIO, was bom at Verona in 1529.
He took at an early age the habit of the order of St. Augustin, and pursued his studies at Rome, whence he was
called to Florence in 1554 to fill the chair of theology in
that city ; but soon afterwards, at his own request, was super-

seded in the office, and obtained leave 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 1552,
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 Marcel us II.,
and by him Panvinio was appointed to a situation in the
library of the Vatican, with a salary of six gold ducats a
month. 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
table, and treated him in other respects with the greatest
liberality.
Having accompanied the Cardinal in a voyage to
Sicily, he was taken ill at Palermo, and died there April 7,
1568, at the age of thirty-nine.
Panvinio was a man of great learning and indefatigable
industry. Niceron, in his ' Memoires,' mentions twenty-seven
and Maffci, in his
of bis works which had been printed
Verona Illustrata,' gives a list of his manuscripts in different
libraries of Italy and Germany.
The most important of his
works are the following, some of which were not printed till
' Epitome Pontificum Romanorum usque ad
after his death :
Viginti-septem Pontificum
Paulum IV.,' Venice, fol., 1557
Romanorum Elogia et Imagines,' Rome, fol., 1568; 'Fasti
et Triumphi Romanorum a. Romulo usque ad Carolum V.,'
Venice, 1557, of which Mader published another edition in
1662 at Helmstadt; ' In Fastos Consulares Appendix ;' ' De
Ludis Secularibus et Antiquis Romanorum Nominibus,' Heidelberg, fol., 1588
De Baptismate, Pascali Origine, et Ritu
consecrandi Agnos Dei,' Rome, 4to., 1560 ; ' De Sybillis et
Carminibus Sybillinis,' Venice, 8vo., 1567 ; ' De Triumpho
Commentarius,' Venice, fol., 1573, and Helmstadt, 1676, 4to.,
by Madcr; ' De Ritu sepeliendi Mortuos apud Veteres
Christianos et eorum Coemeteriis,' Louvain, 8vo., 1672
' De
Rcpublica Romana Libri III.,' Venice, 8vo., 1681
De Bibliotheca Pontificis Vatieana,' Tarragona, 4to., 1587 ;
'
De Ludis Circensibus Libri II., et de Triumphis Liber I.,'
Venice, fol., 1600 ' Amplissimi Ornatissimiquo Triumphi,
cx Antiquissimis Lapidum Nummorum Monumentis, &c.
Descriptio,' Rome, fol., 1618 ; ' De Antiquitatc et Viris
The
Illustrious Veronse Libri VIII.,' Padua, fol., 1648.
following treatises are contained in the great collection of
Dc CiviGraevius, ' Thesaurus Anticjuitatum Romanarum :'
tato Romana,'
De Impeno Romano,' in vol. i. : ' De Anti?uis Romanorum Nominibus,' in vol. ii. ; ' Antiquae Urbis
mago,' in vol. iii.; ' De Ludis Circensibus,' 'De Ludis
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P. qvxnquefotium, Five-leaved Panax, or Ginseng, has a
fusiform root more or less branched, of a whitish colour, and
terminating in fibres. The stem is smooth, round, and green,
often with a tinge of red, divided at the top into three petioles
with a flower-stalk in their centre. The petioles are round,
smooth, and swelling at their base. The leaves ternate,
quinate, or septenate.
The berries are kidney-shaped, of a
The
bright red colour, and contain 2 semicircular seeds.
It is a native of Chinese
flowers are of a yellowish colour.
Tartary and North America. In China it has been considered
an invaluable drug from time immemorial.
In 1709 the
Emperor of China commissioned 10,000 Tartars to go in
quest of as much of this root as they could find ; each one was
to give two jxmnds of the best of it to the emperor, and to
sell the rest for its own weight in fine silver.
The roots
enter into the composition of every Chinese medicine.
It is
reckoned a stimulant and restorative, and both rich and poor
consider it a remedy for every disease.
By Europeans and
Americans, however, it is comparatively disregarded, and
looked upon as a mere succulent, similar in its qualities to
liquorice ; hence the question arises, is the Chinese plant
the same as the North American ? For we cannot regard all
that the Chinese say and practise as merely imaginary.
The
common name of the plant, Gen-seng, Jinchen, or Nindsin,
'
signifies wonder of the world,' or the ' dose for immortality
and the Chinese firmly believe that its powers are almost
miraculous.
[Gisskxg, P. C]
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and

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treatise

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Saecularibus,'

His great

De Triumpho Commentarius, in vol. ix.
De Casrimoniis Curia; Roman ae,' in 1

manuscript in the royal library at Munich.
(Weiss, in Biographic Universelle; Tiraboschi, Sloria

vols, folio, is in

della Letteratura Italiana, vol. vii.)

PAPI'LIO, a genus

of Lepidopterous insects, established

by Linnaeus, and divided by subsequent entomologists into
many groups and genera. It includes that very natural and

known as butterflies.
named BJwpabcera (dubthe arrangement of Boisduval, and Diwrna in that

beautiful assemblage of insects popularly

The

first

horned)

section of Lepidoptera,

in

of Latreille, corresponds with the Linneean genus PapUy
The insects composing it have mostly thin and elongated
antennae, terminated by a club. They are all day-fliers.
Their larvae, which are variously shaped, have six pectoral,
eight abdominal, and two anal feet The pupae are usually
The perfect
anpulated and, with a few exceptions, naked.

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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. Their powers of flight are very great, and the mode of flight 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 Danaii had also about six species. The Nymphalids have the most powerful wings; and the group of Pierides 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 strata, characterised by the peculiarities of the larvae. He names the first strata, Verniformes, the second Juliform, the third Scolopendriform, the fourth Thy- smomorpha, and the fifth Anthropomorpha.

Perhaps the most valuable arrangement of the diurnal Legadopera is that proposed by M. Boddard, who divides them into three great sections and fifteen tribes, as follows, founding his classification upon the characters of the larva:

Section 1. 

A. Six feet in both sexes: caterpillars elongated. Tribe 1. Papilionids.


4. Lycenidae.

C. The males with four feet, the females with six. Caterpillars short.

Tribe 5. Erycinae.


Section 2. Susexisi.

A. Unguis of tarsi simple. Four feet in both sexes. Tribe 7. Dasiidae.

B. Unguis of tarsi strongly bifid. Four feet in both sexes.


11. Morphiidae.

12. Satyrinae.

13. Erassolidae.

C. The males with four feet, the females with six. Caterpillars elongated.


Tribe 15. Napheidae.

See Boddard in the Novitates & Buffon and his other works; and Wood, Insect Entomologici; Horsfield, Catalogue of Lega- dopera 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 Curitae, or as they are sometimes called, Leges Regiae, which were enacted at Rome during the kings' time. This Pappirus is said to have been Pontific 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. i. p. 1. The collection is mentioned under the name of Joa Papirunion, not because he added anything of his own, but because he arranged the laws in due order (Pomponius, Dig. 1, tit 2, s. 2, § 2); and sometimes it is called Lex Papiria. (Servius ad Virg. Aenid, 826.)

PAPIRUS, JUSTUS, a Roman jurist, who compiled twenty books of Constitutions, according to the Florentine Index. There are sixteen excerpts from this work in the Digest. In one of them (Dig. 14, tit 2, s. 50) Papirius mentions a rescript of the Emperor Antoninus, addressed to Avinius Cassius. The fact of the rescript being addressed to Cassius shows that Antonius is the Emperor Marcus Anto-

inus. Accordingly Papirius was living under Marcus Antoninus; and he also survived him, as appears from his speaking of the Divi Fratres. A jurist of the name of Papirio Fronto is cited by Cal- listratus (Dial. 14, cit. 3, s. 4.)

PAPIST. [ROMAN CATOLICHS, P. C. S.]

PAPAW. [CARICA, P. C.]

PAPALIS, B. DES, a genus of Trilobites, from the Silurian strata. (Brookman.)

PARAPET, in Fortification, is generally an embankment of earth which is formed either on the natural ground or on the upper surface of a fortress or outwork. In the latter case the parapet rests on that part of the rampart which is nearest to the exterior of the work, the terreplein, or nearly level part on the interior side, being occupied by the artillery. The majority of the modern parapets have the most powerful shape, and are constructed with stones or brick. Parapets of brick or stone are sometimes constructed for works which are masked by others in their front, or on heights, or on the seacoasts; but in other circumstances they would be improper, because the splinters detached from such materials by the enemy's shot are dangerous to the defenders, whereas the shot sinks into earth without doing further mischief.

The height of a parapet above the ground, or above the terreplein of a rampart which it surrounds, is about 7 feet, in order that it may effectually cover the defenders behind it. In its mass are cut the embrasures through which the guns are fired; the embrasures, or steps, about 3 feet high and 4 feet broad, is usually, of earth, at its foot, on the interior side, in order to enable men, by standing on it, to fire over the upper surface. The form of a transverse section of a rampart is represented in fig. 2, Barton, P.C. ; the parapet with its banquette being that which occupies, on the right hand side of the figure, rather less than the upper half of the space between the dotted lines.

The exterior face of a parapet of earth is generally formed in a plane making an angle of 45 degrees with the horizon, in order that the earth may stand unsupported; the superior surface, which varies in breadth from 3 feet to 20 feet according to the nature of the shot which it is intended to resist (from musket bullets to the balls discharged from the heaviest ordnance), has its exterior crest or edge lower than the other by about one-sixth of the breadth of that surface. It is recommended that the depression of the slope should not bear a greater proportion to the breadth, lest the upper part of the parapet should by its concavity be weakened; but the general rule is that the plane of the superior slope should, if produced, meet the counterscarp line of the ditch in front, in order that the enemy, at the time of an assault, and when detained by the obstacles there, may be completely exposed to the fire of the parapet. The interior face of the parapet, being a part of the parapet is frequently formed in a plane passing through the crest, and, at the terreplein of the banquette, or at the foot of the parapet if there is no banquette, deviating from a vertical plane at an angle of about one-twelfth of the height of the slope. By this inclination the earth, when revetted with fascines or sods, and even without any revetment, will support itself for a time, while a man, by leaning a little forward, is enabled without inconvenience to fire over the parapet.

Occasionally parapets of field-works have been formed with the earth obtained by excavating the ground in the interior; and, in this case, the crest of the parapet may be only 3 or 4 feet above the exterior ground. Such a construction is admissible, however, only when the site of the work is several feet higher than the ground which the enemy may occupy, since otherwise the defenders, except when close behind the parapet, would be exposed to his fire. Again, should the ground about the spot to be fortified be higher than that spot, the crest of the parapet must have a greater height than 7 feet, in order that the defences may be sufficiently covered by it; but in general the parapets of field-works cannot be raised more than 14 feet above the ground; since a man can scarcely throw earth with a spade to a greater height than 14 feet, and a greater height would require, above ground, more than two rows of shovellers, one row 7 feet above the others, and two rows, at an equal interval in the ditch; and it is seldom that the numerical strength of a working party is sufficient to allow such a disposition to be made.

The earth used for forming the parapets should be free from gravel, in order to avoid the accidents which might
from the dispersion of the stoners when shot or shells are fire; the slopes, as well as the banquets, are usually covered with turf.

PARASELENÉ (from σάρα and σαλάμινα the moon). This name is given to the ill-defined and faintly luminous disc seen in the sky by night, surrounding the moon, as the corresponding but brighter spots which are seen in haloes about the sun are called parhelia. [HALO, P. C. S.] The phenomena of parhelia and paraseleunés are ascribed to a like cause, a blending of the rays of light refracted 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.

Edward Alexandre, during his voyage to Melville Island, saw several lunar haloes with paraseleunés; and, once, very nearly the like phenomenon occurred on two successive nights. Two or more haloes to the halo at the opposite extremities of a horizontal diameter, and one at the upper extremity of a vertical diameter; while from the real moon proceeded vertical and horizontal branches of whitish light like a four armed star. It was one of the first records of light issued from the eastern moon, like part of a second halo, and at times ascending almost directly towards the zenith. At another time the moon was surrounded by a double halo, and on the circumference of the outermost, at the opposite extremities of a vertical and a horizontal diameter.

PARENT-DUCHATELET, ALEXANDRE-JEAN BAPTISTE, was born at Paris on the 20th of September, 1790. His father held an office under government which had been in the family for upward of three centuries. At the birth of Alexandre he was possessed of considerable wealth, but the changes and reverses of fortune had seriously affected his circumstances, and he retired to a house in the country called Chattelet, 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, but afterwards returned to 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 kidney, which was not published at the time by M. Martinet; the title is "Recherches sur l'Inflammation de l'Arachnoïde cérébrale et spinale, ou Histoire théorique et pratique de l'Arachnoïde," Paris, 1821. This work is a valuable monograph. The mind of the author was however shortly after directed, through the influence of Hallé, to the subject of public health, and from the period that he first thought on this subject to the day of his death, he devoted all the energies of his mind to it. From 1821 to 1828 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 reports directed to discover the causes of a disease which had occurred on board a vessel which was conveying poudrette across the sea. Parent examined the manufacture of this substance, which consists of a mixture of two matters which have no eunomy of each other, as it is stated 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 action on meat and fish with that had produced the disease, and Parent recommended that in future plater of Paris should be mixed with it, which prevented the recurrence of such catastrophes.

The most important sewers of Paris, entitled "Essai sur les Clouques ou Egoûts de la Ville de Paris, envisagées sous le Rapport de l'Hygience Publique et de la Topographie Médicale de cette Ville," Paris, 1824. Parent-Duchatelet here displayed the peculiar aptitude of his mind for the investigation of subjects which others regard with natural abhorrence. He not only made it the study 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 noisome occupation, and, frequenting them, and surrounding the moon, as the corresponding but brighter spots which are seen in haloes about the sun are called parhelia. [HALO, P. C. S.] The phenomena of parhelia and paraseleunés are ascribed to a like cause, a blending of the rays of light refracted from the parallel sides of small triangular plates of ice with those which are refracted through the sides containing one of the angles.

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scales yellow. It is native throughout Europe, in marshy and wooded places, in Britain and many countries. *D. fimbriata* is a very elegant species; the leaves are remarkably hallowed out at the base close to the lateral ribs, which are connected with one another by a common base like the segments of the leaf. It is also used for birds' ornaments, 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 moist soil and in pots. They must be watered, but not fertilized, since the florets are placed in 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 few weeks. (Don's Gardener's Dictionary; Babington, Manual of British Botany.)

PARNY, EVAIRISTE DESIRE' DESFORGES, Chevalier 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 Kennes; but he appears to have shown considerable indifference 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 called upon to embrace the profession of a priest, and it is said that he attempted to join the brotherhood of La Trappe. An effort of imprudent zeal, however, on the part of the confessor whom he had chosen as his spiritual guide, produced a rapid change in the mind of the young Parny, and he became resolved to have himself intrusted into an opposite extreme of conduct, and soon after, entering into all the dissipations of youth, finally to have enrolled himself in the military profession. He returned to his native island in the age of twenty, where he became acquainted with a young creole lady, the Eleanor of his verse, which acquaintance his fervent imagination soon converted into the most ardent attachment. Their mutual love inspired his first poetical efforts, 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 express nature; for a marriage of interest, which she induced to be acted at the desire of her parents, induced Parny to return to France. Distance and time were unable to efface his real remembrances, and he there continued to translate into the language 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 admired 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 obtain a livelihood by the cultivation of his talents. A painful and slender income now appears to have been to him a blessing, for it had the weakness to adapt to the prevalent taste of a corrupt age. The rival of Tibullus became the feebler copyist of Voltaire, and his 'Paradis perdus,' and 'Galanteries de la Bâtie,' and 'Retour du voyageur,' are mere imitations. By their disavowal of genuine poetic feeling, only will be remembered by posterity as indications of the state of society at a period when 'everything evil was rank and luxuriant.' 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 Devaine. Most of his other poems are inferior to his early productions; his 'Goddam,' published in 1804, is a spirited and inspired parody on the invasion of England by the Norman, his 'Imad and Asilda,' 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 'Joumée Champêtre,' which for simple beauty and delicacy of colouring are deserving of being ranked among the finest specimens of lyric poetry. His principal poem, in eighteen cantos, on the lives of the heroes of Greece, was destroyed by falling into the hands of the suspicious judges of the Revolutionary Tribunal. He died in Paris, after a painful and lingering illness, on 6th December, 1814.

His works were published in 1806, by Didot, Paris, 1808, and at Brussels, in 2 vols. 8vo. The best edition, however, is that by Mons. Boissonneaud in the 'Collection de Classiques Français,' Leuver, Paris, 1827. A volume was published in 1826 entitled 'Poesies inédite de Parny,' with a notice on his life and writings by Mons. Thos.

PAROCHIAL REGISTERS. [Registration of Births, &c., P. C. S.]

PARS. [French, P. C. S.]

PARTNERSHIP. In 1857 a statute was passed (7 Wm. IV. & 1 Vict. c. 73) authorizing the crown, after a reference of an application to the Board of Trade, to grant a species of incorporation to trading firms, known as 'Companies Limited by Guarantee.' The patent may limit the responsibility of partners to a certain sum per share. The company obtaining such a privilege must be constituted by deed of partnership, containing its name, the limits of its powers and 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 which must be made within three months of the date of the patent—in England or Ireland, to the Registrar Office of Chancery; in Scotland, to the General Register House. Notice of the same must be sent within three months. This registration is the criterion both of benefits and responsibilities: no one is entitled to profits unless as securing to registered shares, and no one is relieved from responsibility unless as receiving the benefit of the patent. The extent to which this statute may have been adopted in practice is not publicly known.

PASSAU. [Building-Act, P. C. S.]

PASTA, long-haired seeds of fossil fish from the Baghad sand. (Buckland.)

PASSENGERS. [N.P. C.]

PASSENI, GIOVANNI BATTISTA, a distinguished painter of portraits, was born in 1702. 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 vocation of a painter in 1636 by Canini in the Villa Aldobrandini at Frascati, where he contracted an intimate friendship with Domenichino, then in a state of decay, and on returning to Rome 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 obtained in 1672 a benefice in the college of Santa Maria in Via Lata. He died in 1679.

Passeri is one of the best of the Italian historians of art; his theoretical knowledge was good and his facts are believed to be correct. He was known in his time for being a bit of a rival for nearly a century unnoticed, or rather unpublished, owing to its unfinished state and the want of many of his remarks, especially on Bernini. It was first published in Rome by an anonymous editor, under the title 'Le Passeggi per la Tradizione della Pittoriche' in 1772, with some omissions, under the title 'Vita de' Pintori, Scultori, ed Architetti che anno lavorato in Roma, morti dal 1641 fino al 1787,' by Giambattista Passeri, Pietro Testa, Giuseppe BtschreUnmg, Gio. Ang. Canini, Guercino, B. Borsini, M. F. Mols, Pietro da Cortona, and Salvator Rosa. There is only one public picture by Passeri in Rome, a crucifix which is preserved in the church of San Giovanni della Maia. They are not so rare in galleries. He painted sometimes still-life. His nephew Guiseppe Passeri was likewise a good portrait painter. He died in 1733, aged sixty.

PASQUALINO, DOMENICO D. Michieli been born in 1550, but died in 1611. His picture called Caspari, Cavaliere, was born at Florence about the middle of the sixteenth century. Some accounts give 1560, but this is probably too late. Baglione says he was eighty years old.
when he died in 1638, which would place his birth in 1657 or 1658. He was the pupil of Federigo Zuccaro, 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.

In 1625, having been elected as a pupil of the Academia di Belle Arti, he was 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 he was paid 1500 ducats. In 1638, 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 painting derived from the schools in the Low Countries. Passignano was the friend and associate of Cigoli, and is said to have been the master of Lodovico Caracci, who died in 1638. He had many scholars, of whom Pietro Sorci of Siena was the most distinguished.

(Baglione, Vita dei Pittori, &c., Lani, Storia Pictorica.)

PASTINA/CA (from pastinum, the Latin name for a two-pronged fork), a genus of plants belonging to the natural order Umbelliferae, and the tribe Paeonieae. It has a calyx 5 very small or nearly obsolete teeth; round entire petals, involute, with an acute point. The fruit has a dilated flat margin. The ceps with slender ridges, 3 dorsal equidistant, 2 lateral ones near the margin of the dilated margin. The umbrellas with single linear vittae.

P. sericea, Parnep, has an angular furrowed stem, pinnate leaves, downy beneath, ovate oblong leaflets, crenate, serrate, or entire. It has the same flowers as P. officinalis, not more than 2 feet high. The flowers are yellow. The leaves generally appear before, sometimes downy beneath. It is native of Great Britain and of Europe, even to the Caucasus, on hillocks and sand-dunes; in some places it becomes a thicket of light white, aromatic, mucilaginous, and has a sweet taste. A variety of this species, P. adusta, is the common edible parnep, and is much cultivated in our gardens. For cultivation and uses see P. officinalis.

Another variety, called P. Coquinea, has roots from three to four feet long, and upwards of six inches in circumference. It is extensively cultivated in Jersey and Guernsey as fodder for cattle, and is also planted as a common hedge. It is the characteristic kind of a kind of beer brewed with hops. Wine and as a spirit are likewise made from the roots.

P. Sekukul is another edible species of this genus, and is native of Syria and of Egypt. It has a grey root, a terete downy branched stem, pinnate downy leaves, pinnatifid cleft leaflets, blunt and unequally toothed. It is cultivated in the Levant, under the name of Sekaku.

The species are only to be increased by seed, which should be sown in the open border early in the spring.

(Do.

Don't Gardner's Dictionary; Babington's Manual of British and Foreign Oils, etc.; Babington's Oildom.)

PASTURE, COMMON OF. [COMMONS, P. C.]

PATELOUDEA, a genus of Moluccas proposed by MM. Quoy and Gaimard for certain Gasteropoda, which have a single lid and are limpet-like. The animals are cervice-brancheat. It is synonymous with the genus Lottia of J. E. Gray. The Patella testudinaria of Otbo Fabriuseus, 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, 'subject to the condition that he shall have paid for the said extension 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 period mentioned in the above act. This was created in 1786, and forms the new letters-patent which may have been granted under 5 & 6 Wm. IV. c. 83, to an assignee or assignees, and declares that such new letters-patent shall be as valid as if they had been made new and original. It is clear that nothing in the said act contained shall give validity to any letters-patent heretofore granted to an assignee or assignees, when any action or proceeding in Suire facies or suit in equity shall have been commenced before the passing of this act, whereas 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 brought a design up to the clergy of England, to have incorporated the West Indies, and to have subsequently become a buccaneer. In the account however of the parish of Tinwald, Dumfriesshire, in the first volume of the old statistical account of Scotland, it is stated that in 1660, he declared that in that parish about the year 1660, that he was respectively connected, and that he had more than once sat for Dumfriesshire in the parliament of Scotland. Whatever may be his early history, he must have had ample opportunities of making himself saumipacit and 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 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 plan. It is a natural inference from the interposition of Pedro P. as a means of making the Bank 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 engaged a bankrupt in his stead to its advantage. It is probable however that Paterson, though so able a sh e m e r , was a bad practical man of business; that his invention was perverted on the wing, and that he could not settle down to the routine of business with much advantage to either himself or to others. His next project, if it was not conceived at the same time as that of the Bank, was the renowned Darien expedition. Scotland was at that time filled with speculators, but in this, which was the most adventurous of all, the government 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, of whom Paterson was one, with powers to sell 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 institutions of the country, were conferred on the members. The company raised a large sum of money in England. Its progress roused the English jealousy of trade, and after some representations by the East India Company and other bodies, with houses of parliament presented an address to King William, in which it was complained on the ground 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 of 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 in such a manner as a nucleus of free trade; and its opponents rather fell how unable they would be to compete with this untrammeled community, than saw in its constitution any general principle of the superiority to himself of what were to be left to them. 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, and are shall have the benefit of the said act from henceforth, and shall enjoy all the 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 trade with us without being liable to the punishment in any 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 reprisals, P. C. S., No. 197.

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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 restoration of all private, public, and national rights of all nations; and to all persons, and to all persons and states, who shall be hereafter to 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 on such principles, the 'English partizans' were entertained and promised to be furnished with 'the privileges granted their company would render the country the general storehouse for tobacco, sugar, cotton, hides, and timber; the low rates at which they would be able to purchase all the manufactures of the Dutch, for the English to compete with them.' King William was induced to discontinue the undertaking, and the projectors were deprived of all aid, not only from England, but from foreign countries; yet this only made them more the 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 company was to be conducted, it may be questioned if the place possessed all the peculiar advantages of which it had been made the object, especially at a time when regular commercial enterprise had made so comparatively little progress on the globe. The expedition set out on the 5th of June, 1698; but Paterson never returned to the period of the most ordinary histories of the period, and particularly in Sir John Dalrymple's Memoirs. Paterson was ambitious, but not mercurial, and in the palmy days of the company he had resigned the charge of it to a person of his own acquaintance, with intent to his benefit. The failure of the expedition preyed deeply on his spirits, and grief and disappointment brought him, during his return from the mission, 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 Roman Popes, for which reason we place the article under Roman Caesars.

Pavonia (in honour of Don Joseph Pavon, M.D., of Madrid, a traveller in Peru; and one of the authors of 'Flora Peruviana'), a genus of plants belonging to the natural order Malvaceae. It has a 5-lobed persistent calyx, surrounded by an involucre of 6 to 15 leaves. The ovary has 5, and rarely 4, 1-ovuled cells. It has 10 stigmas, 5 carpels, capular, 2-valved, and 1-seeded.

P. diuretica has coriaceous serrated leaves, velvety on both sides, and full of pellucid dots. The flowers are large, yellow, and staminal. 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 wild flowers, and are abundant in the woods. They are free-growing plants, for the most part ripening seed in abundance, and cuttings will root freely under a hand-glass.

(Don's Gardener's Dictionary; Lindley's Flora Medica.)

Pedicularis is a large genus of plants which is placed under another different accounts, and makes a payment of any one of such sums, he may state at the time of payment on which account such sum is paid, and the payment will be considered to be legally appropriated to the debt which he has named. If at the time of payment the debtor makes no appropriation of the payment, the creditor may at the time of payment appropriate it to such debt as he pleases, provided he applies it to the payment of the said debt, it shall be presumed that he would do, if he were the debtor. Accordingly the creditor must appropriate the payment to such debt as is the most burdensome to the debtor. If neither party makes any appropriation of the payment, the payment will be presumed to be made on account of the more burdensome debt; if there is no difference in the quality of the debts, the payment must be presumed to be made on account of the oldest.

These are the rules of the Roman Law (Dig. 46, tit. 3), which perhaps may be considered to be adopted by the English Law, though the decisions are by no means uniform in the application of its principles. In Noble, 1, 162, 926, the parties just laid down apply to distinct debts on different accounts (cause). If there are dealings between two persons which are all of one uniform and continuous nature, as for instance between a banker and his customer, there is no question of appropriation of payment. The customer pays money into the bank at different times, and draws it out by drafts at different times. All the sums paid in and all the sums paid by the bank and remitted to him are to be considered a single account, and by striking the balance at any given time it will appear what sum is due at that time from the banker to his customer or from the customer to his banker. It is true that this would be the case under the English law; but there is a kind that which is meant by the term. It assumes that the sum first paid in is discharged by the sum first paid out, so far as it is sufficient to discharge it; and the same remark applies to the account at the sum and sums drawn out. The account therefore must be made out in the order of time, and the balance will show how the account stands at the time when it is made out. (Devaynes v. Noble.)

There are various cases in the reports in which the question of appropriation of payments has been discussed. (Boddenham and Purchas, 2 B. and Ald. 39, Simpson and Ingham, 2 B. and Cr. 65; Pemberton and Oakes, 4 Russ. 164; and others.)

Pear-gage. The principle of Smear'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 tube is a cup of mercury, and a receiver for the residue of the barium. A wire is placed so as to make the wire open the end of the tube may be immered in the mercury. The exhaustion being made before lowering the wire, the air in the tube will be rared equal to that in the receiver. As the wire is lowered, the receiver is admitted to the tube, the mercury will rise in the tube until the elastic force of the compressed air in the tube, together with the column of mercury, counterbalances 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 elastic force left in the receiver, the pear-gage submits the air, or whatever else there may be, to a process of compression before the measurement is made. If there be nothing but air, all the gages agree; but if, as generally is the case, there be also vapour, the pear-gage submits and much higher degree of apparent exhaustion than the ordinary gage. For further detail see the article 'Pneumatics' in the Encyclopedia Metropolitana.

Peculiaris, Court of, is one of the English ecclesiastical courts, or in the province 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 cases in matters ecclesiastical within the archbishopric of Canterbury, or within 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 a general supervision, but not of any of the parishes of which it is independent of the jurisdiction of the several bishops within whose dioceses they are locally situated. (Political Dictionary, article 'Ecclesiastical Courts.')

Pedicellaris (from the Latin word pedicellus, a louse, from its supposed quality of making sheep that feed upon it lousy), a genus of plants belonging to the natural order Scrophulaceae. It has an inflated 6-toothed calyx, a ringed corolla, with the upper petals fused, and the lower petals plano 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 corymbi.

P. palustris has a solitary erect stem, branched throughout, pinnatifid leaves, with oblong blunt lobed segments; an ovate subsessile 2-lobed calyx, the lobes incisus, dentate, crisped. The upper petals of corolla has a small 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. It is the type of Pedicellaris Herba of Columella. 60, and of Scrophularia Lurges, P. gynacina has a stem branched at the base, erect, the branches long, spreading, and prostrate; the leaves pinnatifid, loblets ovate and deeply toothed. The upper lip of the
corolla as in the last species, the flower large and rose-coloured. It is found on wet, moist, and rather lightly grounds in Europe, and Great Britain. The expressed juice of the herb, or a decoction, has been used with advantage as an injection in serious ills. It is injurious to the sheep that feed on it. There are 75 other species of Pediu-

colony, Queen Isabella, the Queen of the Portuguese colony in Brazil, the Banda Oriental, the inhabitants of which were devious of annexing themselves to the new empire, and a war was the result, which terminated unfavourable to the independence 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 patriotic spirit in the Brazilians, and they declared himself of the kingdom which descended to him by hereditary right to the empire at whose head he had been placed by the will of the people, and thus Brazil should again become reduced to the position of a confounded Portuguese colony. Never however he endeavoured to dispel by abdicating the crown of Portugal in favour of his daughter Donna Maria da Gloria, respecting to himself the regency, with the title of king, during her minority. The instability of popular government has resulted from continual disturbances of a political nature throughout the country.

In 1830 the French revolution gave a new impulse to the democratic party, and an affray which took place on the 8th of April, 1831, the details of which are given in the article Brazil, P. C., determined Don Pedro upon abdicating the throne in favour of his son, to whom, being under age, he appointed a guardian, and the following day he left the country.

The throne of Portugal, which Don Pedro had resigned in favour of Donna Maria, had been usurped by his brother Don Miguel, whom in 1822 he had appointed regent of the kingdom. His object was to send the country from the usurper, and to reinsate his daughter in the rights of which she had been deprived. The plan of the enterprise was matured during a somewhat long residence the emperor had in Paris, where he was retained by his daughter, Queen Maria, who had espoused his cause, at the head of whom was General Baldanha, 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 Cyclopaedia. (Portugal, P. C.)

On the 26th of May, 1832, Don Miguel was reduced to the necessity of signing a convention, which left the young queen in quiet possession of the throne of Portugal under the regency of Don Pedro.

His acts of 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 had been expedient, were certainly unjust. He strengthened the external 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 masonic establishments in his kingdom. The anathemas of the Vatican were the natural result of these sweeping measures, and they were soon followed by the death of his own excomunication. In Spain, 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 under the interposition of his delicious state of 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 long survive to see the event. He died in 1834, and left the palace where he had been born the scene of his death on the 24th of September, 1834.

The life of Don Pedro is chiefly interesting as it connected with the general history of the period; the details of 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, 1760, 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, appeared to have been of some respectability for several generations. It is said to have been lately traced back to the sixteenth century. Sir Robert Peel's mother was the daughter of a clergyman of the Established Church; but the common accounts go no higher than to the great-grandfather of the subject of the present notice. He was a gentleman of the name 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 was a young man he went to sea. It is said that 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 personal success in the acquisition of wealth and station was also of course operating as a powerful example and incentive. The mechanical processes of the trade are said to have made engaged much of Peel's attention, though they were never inclined to him for any improvement, so far as we are aware. He made his fortune by his general ingenuity and sagacity, by his great activity and intensity of mind, and by his considerable boldness of enterprise, and by his admirable conduct of business, alike in its largest scope and in its minutest details.

In 1799 Mr. Robert Peel entered into partnership with Mr. William Bury, of Nottingham, and became a member of that important and respectable body of members of Parliament, who, in the next session, in the session of 1810, 60,000,000. of their he 2, the 1584, 'was Comus. The capital.

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corroboration is afforded by the play itself. Thomas Campbell, in his 'Specimens,' has spoken of Peele more favourably than any other critic. There is more of justice in the cool estime of his merits formed by Mr. Dyce and others. 'Those of the Essene order,' says Mr. 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 management of his incidents 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 has preserved for him a reputation without 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, sooner or later would have procured an appointment for him in the French Academy but for the rupture between France and Britain, and the latter had some time been employed in the service of the French admiral of Naples, M. de Pellerin, a commissioner of the navy (commissionnaire de la marine) in 1718, and sent him on service to the great harbours of France, and in 1723 he was destined to make a general inspection of all the harbours, but a change 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 he was appointed minister commissioner general, and afterwards was made first clerk of the navy (premier commissaire de la marine), in which office his activity, probity, and firmness, combined with the sway of his manners, 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 curiosity, but afterwards from a taste for them, as muniments of his profession. He applied himself to the study of inscriptions, after his retirement, he began to read, explain, classify, and arrange them. His early studies in the oriental languages, as well as in Latin and Greek, were renewed, and became a source of particular profit to him in behalf 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 80, 1784, in his ninety-sixth 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 kings, nations, and tribes, which divided the division of nations. His descriptions of the medals, with his comments and remarks, formed a large Catalogue raisonné, which he published under the title of 'Recueil de Médailles de Rois, Princes et Benefacteurs de France,' in 1719. His delight in his favourite study was such that when upwards of ninety years of age and blind, he composed and wrote with his own hand, by means of an ingenious contrivance, the last volume of this work, which was finished in the year 1770.

Peeter, in his 'Doctrina Numorum Veterum.' [Ecつき, P. C.] Pellerin and Ecつき were both friends of the great savant, and in 1767 he subjoined to the former, his beautiful collection of medals, which consisted of 23,500 medals, was bought by the King of France, in 1776, for 300,000 francs. The king afterwards allowed it, 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. [Prissis, James, P. C.; Afghanistan, P. C. S.]
dable value in the diocese of Auch. However, he is favourably distinguished from most prosectys by the lenient and tolerant disposition which he evinced towards those who disagreed with him in opinion, and when high in royal favour, he publicly and privately opposed by his influence and writings the violent measures which were employed by the king's command [Nayrte, P. C.] to bring his Protestant subjects to the Church of Rome. In 1571, on 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, Portuguese, and even Arabic. In 1691, having incurred the displeasure of Madame de Montespan, he was deprived of his office of royal histriographer, but, at the special request of Louis, he continued to write the Life of King Sadiq, which he supplemented 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, by 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, were: 1, 'Historie de France,' which was first published at Paris, in 1653; the best edition is that by l'Abbe d'Olivet, by whom it has been continued, Paris, 1730. The fault of this work is generally considered to have been that a style of the sort was assumed by Bishop Sprat, in his 'Hist. of the Royal Society of London' (part i., sect. 19). 2. 'Historie de Louis XIV.,' which extends from the death of Mazarin, in 1661, to the peace of Nimwegen, in 1678. This history has the faults to be expected in a work of a professed courtier; the best edition is that of Paris, 3 vols. 12mo., 1749. 3. 'Abrege de la Vie d'Anne d'Auvergne,' 1696, in 4to.; a panegyric rather than a history. 4. 'Journal du Temps d'Henri des Jardins.' Two vols., 1696. 5. 'Les Memoires du Pere Demoiselle;' this work has been greatly praised by Voltaire. 6. 'Lettres Historiques et Oeuvres diverses,' 9 vols. 12mo., 1749; the letters, 278 in number, are a journal of the king's journeys and encampments in the above-mentioned campaign. 7. 'Recueil des Pieces Galantes,' 5 vols., 1696, being a correspondence in prose and verse between him and the Comtesse de Suz; his verse parries of the elegance of his style in prose, but it is deficient in imagination. 8. ' Reflexions sur les Differeins de la Religion,' 4 vols. 12mo., an answer to the arguments of Juxo on religious toleration; on this treatise Bayle has made some very interesting remarks in his 'Histoire du Basisme.' 9. 'Traite de l'Eucharistie,' a work he left unfinished. The Prologue in verse of the comedy 'Les Feecheurs de Mollere,' is stated in the 'Dictionnaire des Arts' (vol. i., p. 90) to be by Pellisson, and an edition of the first scene of the play has been published by Deceasta, Paris, 1805, 2 vols. 12mo. (Bayle. 'Diction Histoire.' Biographie Universelle Classique. Dugree. Jaugere. des Moeurs, vol. i., Menagione, vol. ii. p. 16, 89, 207, 301; 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 penstock sluice is given under IRRIGATION, P. C., p. 42. See also Sluice, P. C., p. 142.

PENTZ, PENCZ, or PENS, GEORG, a celebrated German painter and engraver, was born in Nuremberg about 1500. He was first the pupil of Albrecht Durer, and he afterwards studied the works of Raphael at Rome, probably after the death of Raphael, but before his school was dispersed. He was a pupil of Pint, as some accounts give, it must have been after the dispersion of the school of Raphael that he was in Rome. He died, according to Doppelmayr, in 1550, at Breslau. His pictures are the most correct in design of the early German masters, perhaps the most correct. His prints are numerous, but his pictures are scarce; there are some at Nuremberg, and a few in the galleries of Berlin, Munich, and Stuttgart; the engraver copy in the edition of 1550, at which he was so busily engaged, by Pints, of which the best are seven of the history of Tobias. He was the pupil of Marcantonio, and assisted in some of his prints after Raphael.

embellish the two palaces of the Tulleries and the Louvre, of which latter more especially the very extensive, numerous, and complicated works fully occupied them for a series of years extended to the restoration of the castle of the Tuileries.

This accounts for the successes we have seen; all their high reputation, been employed on so few buildings; and flattering and favourable as it was, it was not wholly without drawback, because they have aimed at 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 east front of the Tuileries, and also on the ground-staircase 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 like is the style of their professional fame, being no more than a handsome and regular piece of street architecture.

For the general celebrity attached to their names, Pérard and his colleague are perhaps, after all, mainly indebted to their publications, and not least of all that entitled "Recueil de Decorations Intérieures, contenant tout ce qui a rapport à 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 of mere fashion, that Pérard lived to see it pass away. Another publication, known as "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 subjects of the latter, as recording the ceremonies and pomp at Napoleon's coronation; the other, those which took place on his marriage with Marie Louise. Besides these, there is another work attributed to Pérard, but which did not appear to have got into public circulation, "Parallèle entre plusieurs Résidences de Souverains de France, d'Allemagne, de Suède, du Royaume d'Italie, et d'Italie," Paris, 1833, with thirty-eight plates.

Perard died in Paris, 1858.

PERCOIDE (or Percid), a family of Acanthopergygous osseous fishes, of which the perch is the type. The Percoideæ have bodies covered with rough scales, ciliated at the margin. The shape of the opercle or preopercle is dentilicate or spiny. The vomer, both jaws, and usually the palatine bones, are armed with teeth. Perca, Trachinus, and Mullus are British genera of this family. Beryx is an intertropical percid genus, containing two or three species remarkable for bright-red colours, tinged with golden hues. Holocentrus is a allied genus, including very beautiful fishes, mostly tropical species. Myripristis differs from Holocentrus in the form of its second dorsal spine. Trachichelys is also a genus of this family.

PERIDINUM, a genus of inferior fossils, which occur in flint (Chalk). Pteropoides, a genus of fossil Crinoid echinoderma, found in the Silurian strata. (Austria.)

PERIODUS, a fossil fish from Sheppey. (Agassiz.)

PERKY, JAMES, was born in Aberdeenshire on the 30th of October, 1756. 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 1771 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 local traditions of his having been found an inefficient clerk, and the story is still told 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 dismissed him as incorrigible, and blighted all his prospects of becoming a prosperous country attorney. Perry was master of that ordinary Scottish education which fits its owner for many of the progressive and less-established departments of business or literature. He first proceeded to Edinburgh, where he seems to have acquired a tolerable knowledge of the law. He went afterwards to Manchester, and was rather more fortunate, obtaining employment at clerk to a manufacturer. He had all along occupied his hours of involuntary leisure in cultivate knowledge and experience. He was henceforward to medicine, and went thence in 1771 with introductions to people of some influence in London. Among the friends who had given him general promises of assistance in procuring a situation was Mr. Urquhart the bookseller.

Perry had in the meantime dropped some anonymous contributions into the letter-box of the 'General Advertiser,' which daily appeared in its columns. In one of his unsuccessful visits to Urquhart, that gentleman, who had been highly pleased with his past performance, turned the last subject of his conversation to the 'General Advertiser,' and told Perry if he would like that he would at once procure an engagement. The delighted aspirant claimed the article as his own, and produced from his pocket book the last of which he was about to drop into the letter-box. He was immediately engaged as a stipendiary contributor, both to the 'General Advertiser' and the 'Evening Post.' During the trials of Keppel and Palliser, he furnished the London papers with notes of the reports of the proceedings. Becoming subsequently editor of the 'Gazetteer,' he systematised the method of rapid reporting, by establishing the employment of relays of reporters, which has made so marked a change in the nature of the daily press. He became afterwards joint proprietor and editor of the 'Morning Chronicle,' to which he communicated a decided Whig spirit, which it has ever since retained.

His marked position he was the first selected to be the victim of Sir Vicary Gibbs's attempt to crush the independent press.

On the 24th February, 1810, his case came on for trial before Lord Ellenborough and a special jury, on an ex officio information, and was heard, with great deliberation, but was not decided. One instance of the change was a reprint in the Chronicle of a paper in the 'Examiner' descriptive of the blessings which might be anticipated from a new reign commencing with a change of system. This was resented by the Government; and at this juncture, the Peer himself was a barrier to improvement. Perry defended himself, maintaining his right to inculcate the necessity of improvement, and to look with hopeful anticipations towards any quarter whence it might come. He was tried for his own, and maintained in the paragraph—the necessity of a change—had not been said in one solitary instance, but was the doctrine he had ever promulgated since he had risen to manhood. The jury pronounced a verdict of Not guilty, and the Peer, with informations dropped. Mr. Perry died at Brighton on the 6th December, 1821. He was the author of some pamphlets and poetical pieces, the reputation of which was temporary.

PERPIRATION. (Sav., P. C.)

PESNE or PENE, JEAN, a French painter and engraver, distinguished chiefly for his excellent prints after N. Poussin.

He was born at Bosen in 1626, and died in Paris in 1700. The chief merit of his prints after Poussin is the preservation of the peculiar style of that painter: they are generally of a large size, and are valued by collectors. He engraved also many prints, chiefly after the master, after Annibale, and after Borel.

(Pawlet and Leverque, 'Dictionnaire des Beaux Arts; Huber, 'Manuel des Amateurs, etc."

PETASITES. (Tussilago, P. C.)

PETECHIA (or Petechia, or Petechia), a genus, distinguished as the being of a purplish hue.

PETREHILLY, a village in the county of Lorne.

PETRILLIUS, a genus of plants belonging to the natural order Petiveriaceae.

PETIT SERJEANT. (Serjeant, P. C.)

PETITVERIA (in honour of Mr. James Petiver of London) a genus of plants belonging to the natural order Petiveriaceae. It has 6, 7, or 8 stamens; 4 permanent styles, at length becoming spiry and reflexed; the point is armed with spines at the apex. The species are West Indian herbs, and in pastures are troublesome weeds, giving an unpleasant flavour to the milk of cows which feed upon them.

P. alliacea, Guinean-hen Weed, is a small bush with a disagreeable smell. It bears an erect downy stem, not branched, and of a deep green colour. The leaves are oblong-obovate or oblong-lanceolate, and scarious at the edge, glandular near the petiole, which is both glandular and downy; the stipules are small and spiny. The spikes are long, slender, and drooping at the upper end. The flowers are white, and placed close to the rachis, which is angular; the style is 4-angled, with linear spreading segments, which afterwards become erect, leafy, and cover the fruit. The juice of this plant is exceedingly acrid, and if a small portion of it be chewed it will render the tongue as dry, rough, and black as in cases of malignant fever.

The negro considers it a sudorific, and say that fumigations or vapour-baths of it will restore the motion toparalyzed limbs. The roots are used as an toothache; the negroes also employ it to procure abortion. The plant is rejected by most animals as food. Pittavedas alone seem fond of it; hence its common name Guinean-hen weed.
Marius says *P. tetandra*, another species, is employed in Brazil, under the name of *Roja de pipi*, in warm baths and lotions for defective contractility of the muscles or in paralysis.

(D. Lindley's *Flora Medica*; Burnett's *Outlines of Botany*.)

PETRÓSELIUM (*fetidus,* which means 'rotten parsley,' rock being the habitat of the species), a genus of the Umbelliferae, has an obsolete calyx; roundish entire incurved petals, scarcely emarginate, contracted into an inflexed lobe. The disk is short and somewhat annulate. The fruit ovate and contracted at the side. The species are smooth-branched herbs. The leaves decomposed, with wedge-shaped segments. The involucres many-leaved; the flowers are white or greenish, uniform; those of the disk often sterile. The stamens longer than the corolla segments. *P. sativum*, common Parsley, is described under Parsley, P. C.

P. *sagittatum*, Com. Hornflower, has pinnate lower leaves, usually sessile, leaflets, ovate and serrated, the upper leaves entire or trifid. The umbels are very irregular, the general involucre having from 1 to 5 leaves. The flowers are white, the stems erect, roundish, nearly leafless above from a foot and a half high. It is found on damp soils in a calcareous soil in Great Britain, France, and Switzerland. Goodyer has given an accurate account of this herb, and says that the origin of its name was from the fact of its having cured a swelling in the knee.

The species are easily cultivated and can be raised only from seed.

(Don's *Gardener's Dictionary*; Bahbgton'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 England. (Edgeworth.)

PEUCE/cANUM (the *Sclerophyll* of Theophrastus and Dioscorides, from *vexxii* a pine, on account of the resinous smell of the plant), a genus of plants belonging to the natural order Umbelliferae and the tribe Peucedanids. It has a calyx of 5 or 6 parts, oblong 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 filaments, 2 lateral close to the base of the dilated margin obsolete. The interspace has simple 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. officinalis, 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 ternate, with linear lanceolate ovate-acuminate segments. The flowers are white and deciduous; the pedicels are much shorter than the fruit. The fruit of a pale brown colour, the vittae of a deep chocolate; the primary ridges much depressed and paler. The compound fruit has the color of the vittae, with conspicuous vittae 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 aromatic smell. Many sicknesses have been attributed to it, and it is reputed anti-sapromedic and diuretic, but it seems to be rather a dangerous internal remedy.

P. ovoaculins has a taper straited stem. Trifoliate leaves with the petioles broke 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 white from the whitening of the acid cells. 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 is an erecting simple root with many long fibres. The stem is erect from 4 to 5 feet high, hollow, deeply furrowed, smooth branched, and corymbose at the top, and of a bright purple colour at the base. There are about 5 or 6 leaves on a scaly petiole, the leaflets remote, remote, divided; the leaflets are opposite, deeply pinnatifid, dark green and smooth; the petioles straited, smooth, with a reddish membranous margin. The flowers are white and numerous; the fruit is 5-seeded, much larger than the stylos, the calyx, of which is reddish. The root is said to supply the place of ginger in Russia. The whole plant abounds in a white bitter fidded juice which soon hardens into a brown acid resin. It is a famous remedy in Cornish in epilepsy.

P. palustris has 3-pinnae leaves pinnatifid with linear lanceolate acuminate segments, the general involucre of many persistent lanceolate deflexed leaves. The stem is furrowed and from 2 to 3 feet high. The juice is yellow. 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*; Bahbgiton's *Man. of Brit. Bot.*; Lindley's *Flora Medica*; Burnett's *Outlines of Botany*; Lindley's *Vegetable Kingdom*.)

PEVELEY (Sussex, P. C.)

PETZTAL (Herc. of the ancient P. C.S.)

PHACOPUS, a genus of Trilobites, found in the Silurian strata. (Emmerich.)

PHALI/NA (GASTROMETERS, P. C. S.)

PHANEROT/INUS, a genus of fossil Gasteropoda, from the mountains in Scotland of England and Ireland. (Sowerby.)

PHANTASMAGORIA. (Magic Lantern, P. C. S.)

PHARBITIS, a genus of plants belonging to the natural order Convulvulacae. It has 5 sepals, a campanule funnel-shaped corolla, one style, a capitate granular stigma, a 3-celled rarely 4-celled ovary, and 2-seeded fruit. This genus is easily distinguished from others of the same order: they are mostly climbing American herbs, usually beset with retrogenetic spines.

P. Nil has twining annual round hairy branches and stem stalked, 3-lobed, 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 'Kal station' and are said to be a purgative and an efficacious speedy cathartic. They are roasted like coffee, powdered, and added to the drug. Some of the doses of fresh leaves are very dangerous to life. 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 them best.

(Don's *Gardener's Dictionary*; Lindley's *Flora Medica*; Burnett's *Outlines of Botany*.)

PHASCOCHGERUS. (Sides, P. C.)

PHILLIPS, THOMAS, R.A., one of the most distinguished English portrait painters, was born at Dudley, in Warwickshire, 18th May 1765, and was placed versus his time, with Mr. Edginton at Birmingham to learn to paint on glass; and he came to London in 1790 with a letter of introduction to Mr. West, and exhibited his first picture at the Squadron paintings in St. George's Chapel. In 1792 Phillips exhibited before the Royal Academy a view of Windsor Castle from the north-east; and in the following year he exhibited two historical pictures—the Death of Talbot, and the duel of Sir Walter Raleigh and Sir Walter Devereux, at Egremont, 11th June 1586. He received likewise two pictures of similar classes in 1794—Cupid disarmed by Euphrasyne, and Eliah 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 that his reputation is founded, 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 was substantially patronized, 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 received a commission into the 2nd Dragoon Guards, 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 fine portrait, painted in 1814, by himself at Egremont 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 1835, dedicated to the Earl of Egremont, under...
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Procured, the way of criticism, and the style of his philosophy. In the same way, the title 'Lectures on the History and Principles of Painting;' the fourth, the sixth, and 'the seventh in Composition;' the eighth on Colouring; the ninth on Chiaroscuro; and the tenth on the Application of the Principles of Painting. This book was aott to Dr. and the text is in the form of a philosophical exposition of the subject. It is a work of great merit, and is valuable in its own right. The author, in the third edition, has corrected and improved the text, and has added a number of illustrative examples. The book is a valuable addition to the literature on the subject of painting, and is a valuable contribution to the study of art.
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. It is therefore possible that. in the case of the wood from which the luminosity is given off 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 tissue attended with a formation 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 frequently observed. It is constant amongst some forms of fungi, especially of the genus Rhizomorphae. In the cool-mines in the vicinity of Dresden the species of Rhizomorphae are so numerous as to dazzle the eye by the brilliant light they afford.' [Breslau, P. C. S.] The light from decaying wood, as also from the living Rhizomorphae, continues although they are immersed in irreproducible gases, linseed oil, phosphoric acid gas, oxygen, &c. The phenomenon in both the living and the dead wood of other species of plants is due to the same cause.

Another class of plants in which light has been observed is the Mosses. Several species of the genus Schichtostega, which grow in caverns and other damp places, have been examined for light. Mr. Bancroft and other observers have observed it in this country in the S. penusala; whilst, Funk, Brandenburg, Nees von Essenbeck, Hornschuche, Struve, Unger, Bridel-Bridere and Agardh, have observed it in the same species of the same genus. The light is given off to a small alga, which Bridel-Bridere called Catoptridium smaragdimum, and Agardh called Protococcus smaragdinus, which they supposed was parasitic on the moss. Unger observed that the moss is luminous only in the evening, Bridel-Bridere at night, and in all cases, the moss is emitting no light at all. The moss is luminous on this occasion only, when the moss is immersed in water, and is not luminous when the light of the sun or moon is reflected on the moss. The moss is luminous only when its surface is wet.

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 bright sunny evening, when she observed the flowers of Tropaeolum 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 two different gardens, and while others have seen it also. A correspondent of the 'Gardener's Chronicle,' October, 1843, says: 'I have frequently observed the luminous appearance of garden plants, and have looked for a long time to find out the cause. I have seen many on land and more especially on the Papaver papilion, the hairy red poppy, in my garden at Worcestershire. 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 Coleoid alludes in the following lines:

"The said on summer's evening hour,
Flattens the golden-coloured flower
A blue electric flame."

Decaying animal bodies frequently emit a luminous appearance, which has generally been attributed to the presence of phosphorus of lime in their skeletons, which become decomposed and yield phosphorus 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, Spontaneous, 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, its sides are suddenly illuminated by a bluish light, 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. Poepig, in his 'Reise in Chili, Peru, and the Galapagos,' describes this phenomenon in an equatorial sea. While not all the vessel is 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 glittering from greater depths, till at last, with the light like a rapid flash of lightning. A great number of these beings are undoubtedly true night animals which conceal themselves during daylight in the deep dark depths of the ocean.

These lights in the sea are principally produced by various species of the family Acalephae, 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 Acalephae; many species of Polypterus, some of the Echinodermata, and the lower forms of Mullusca, 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 luminous power belong to the Coleoptera and some cases of the beetle tribe.

(Meyen, Eptauen-Physiologie, Band ii.; Carpenter, Animal Physiology; Lankester, Gardener's Chronicle, 1843.)

"PHOTOGRAPHY."

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practical perfection. The peculiarities of Daguerrotypes, pictures being already described under Parochomic 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 this art is steadily gaining ground, it being already extensively used in other parts of the world, such as the United States, Canada, and other countries, as well as in the manufacture of buildings, &c. A pretty full account, illustrated with engravings of the apparatus employed, of the Daguerrotype process, both as originally practised in this country under the name of the Daguerrotype process, in its branch of papier-maché, &c. by Mr. Richard Beard and M. A. J. F. Claudet (both of whom had purchased licences of M. Daguerre), is given in the Supplement to Dr. Ure's Dictionary of Arts, &c. art. Daguerrotype. Of late improvements are reported. 'Bulletins of practical applications' 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 Daguerrotype 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 Daguerrotypes portraits more correct and more pleasing by the improved management of light, and by placing behind the sitters painted screens, to relieve the head, and to form artificial backgrounds. One of the greatest difficulties in the original method was that there seems no way in which the reflecting or refracting produced in the camera-obscura was totally invisible until brought out by a subsequent exposure to the vapour of mercury, it was impossible to tell precisely at what moment the action of the light on the plate was to cease. In the hand, an image imperfectly developed, and, on the other, the misty, indefinite appearance occasioned by the unavoidable motion of the object to be copied (whenever it is an animate 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 object. By placing in the camera-obscura an image, and providing means to enable the operator to watch the progressive development of the image. One important class of improvements has reference to the means of fixing and securing from injury by the subsequent action of light or other means, the Daguerrotype image. M. Claudet, in the paper above referred to, after alluding to some inventions for this purpose, observes, that 'it was left to Mr. Fox Talbot to discover what has proved one of the greatest improvements in the Daguerrotype 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 chloride of gold, which not only renders the image more durable, but has the advantagous influence of bleaching the tint, so that a picture fixed by Mr. Fox Talbot's process is rendered more forcible, and the mirror-like effect is almost destroyed.' 'And so,' adds F. C. H. A., 'pp. 92, 99, is an account of experiments, by M. Ules, of Havana, which were in the same direction as that of M. Claudet, and which show that the durability of Daguerrotype impressions, from which it would appear that they may be rendered insensible to the action of light, and of some more trying chemical agencies; and that, whenever it is desirable, the image, or rather, the former, or representation of the latter, may be reproduced by the action of heat. On p. 292 of the same volume is an announcement of a method of Daguerrotype fixing, 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 account of this invention, we are led, from the results obtained by the practical experimenters, to suspect that in this, as in the other cases above to be mentioned, the colouring was not simply the result of the action of variously coloured rays, but of a uniformly coloured Daguerrotype, some of which may be tolerably near approach to the effect which might be expected if colours could be fixed in the camera-obscura, the lining produced by the application of fixed image being preserved in the Daguerrotype 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, and yet, as may be inferred from the photographical impression, is already present on the surface of the plate. 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., which consists in heating the Daguerrotype plate, and washing the surface with a solution of wine, and then of the oxides of copper upon the surface of the Daguerrotype plates, in lieu of the deposit of gold invented by Ficeau. An account of this process, reprinted from 'Stillman's Journal,' appeared in the Athenæum for 1845, p. 277. Mr. Ficeau, the inventor of the mode of fixing Daguerrotypes by a golden deposit, has also devised a process, of which an account was presented by Mr. Godfrey to the British Association in 1846. Mr. Godfrey's Daguerrotype is a product of christian cement with the aid of an acid menstruum; by which means the Daguerrotype is converted into a perfect, though very faintly-engraved, plate, capable of yielding impressions. Though too delicate for use under ordinary circumstances it may be finished by an engraver, and it is anticipated that the process may be advantageously applied to minute anatomical illustrations, and similar purposes in which the utmost fidelity and delicacy are requisite. M. Claudet, in the passage already quoted, mentions the names of M. Donné, of Paris, Dr. Berres, of Vienna, and Professor Grove, in England, as having, concurrently with Mr. Ficeau, attempted to accomplish this object. Before turning to other branches of the art of photography we may quote from the conclusion of M. Claudet's paper the remark that, notwithstanding the very recent origin of the Daguerrotype, it already ranks as one of the most prominent inventions of the present day, leaving scarcely anything to look for in the way of improvement. 'It is true,' he adds, 'that it remains to find the means of reproducing the natural colours of objects; but, although the colour is not yet perfect it is distinctly instructive; and, as the progress of science, and with the properties of the known elements, that of the Daguerrotype is yet in the first stage of its existence, we may anticipate that it will attain high perfection and perfection will be a matter of time.' The process invented by Mr. H. Fox Talbot, and known most commonly by the name of Calotype, but recently called, in commemoration of its inventor, Talbotype, is a photographic process which does not present one single fault which, though not brought to so great perfection as regards the representation of minute details, claims some important advantages in point of cheapness and convenience. Mr. Talbot's method has been most extensively applied to amateur purposes, and to try to use the camera-lucida for the purpose of sketching, in October, 1833; but although his photographic researches date from that time, his invention of the Calotype process was not completed until September, 1840, and in this time some minor improvements have been made. Both the original invention and its subsequent modifications are secured by patent. In a description of the process communicated shortly after its invention to the Royal Society, and published in the Athenæum for 1841, pp. 540, 541, Mr. Talbot gives directions, from which the following are abridged, for the preparation of the photographic paper which, in this branch of photography, is used instead of the silvered plate, of Daguerre.
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, did we know of easy methods to suit them well for this purpose; and 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, as they are also in the Daguerréotype, the picture is brought out by chemical vapour. In the Chromotype, nitrate of silver is the active material for the same purpose; and it may be used to bring out pictures under similar circumstances to the silver paper. In the Chrysotype, a beautiful process discovered by Sir John Herschel, a dormant picture is brought into view as a powerful negative image, by washing the paper with chloride of gold.

In the Cyanotype, the same phenomenon has been under the influence of the ferro-prussiate of potash. The Ambrotype, and some other processes, the result of the researches of the same investigator, Sir J. Herschel, are of a remarkable character: the pictures remaining dormant so long as the paper is kept dry, whilst the simple process of breathing over it discloses the hidden picture with wonderful intensity. Lastly, the Energieotype, or, as the discoverer now names the process, the Ferrotype, enables us to keep the pictures invisible on the paper, and to reveal their image by a blow of force in an instant, by washing with a solution of an iron salt.

These are but a few of the curious phenomena which have resulted from the discoveries of Niepce, Daguerre, and Talbot.

Arago even declares that the discovery of Daguerre's process, 'In this instance, it is upon the unforeseen that we are especially to reckon.'

That we are as yet only beginning to understand this curious branch of physical science, is manifest from the uncertainty which yet prevails as to the precise nature of the agency by which photographic impressions are produced. Several phenomena have been observed which lead to the supposition that the remarkable chemical changes which such impressions are produced are not due to the simple action of light itself, but of 'some power associated with it, which, according to the writer from whom we have just quoted, 'may possibly be the result of some action of the air; and it does not appear,' he adds, 'from experiments described by Mr. Hunt, that we can separate, to a certain extent, these influences one from the other by coloured media."

There are, therefore, he subseqently observes, '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. Sir John Herschel proposed the epithet of Actino-chemistry for this new branch of physical-chemical science, and it has been suggested that Actinum would be an appropriate term to distinguish this chemical power from the light and heat with which it is associated. As a subject for the future, the full subject to the circumstance mentioned by M. Claudet in his paper already referred to, that the operation of the Daguerréotype has been found to be much slower, with the same brilliancy of light, in the moonlight than in daylight; as 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 defective. In a review of 'The Pencil of Nature,' in the 'Athenaeum' for 1845, p. 693, it is observed that perhaps this defect might be remedied by some alteration in the paper, and we are informed that paper prepared with bromide of silver, if exposed to the purer sections of the spectrum, will be found 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 act photographically. It being supposed that the chemical principle, or actinum, 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 Daguerreotype plates and upon paper, whereby 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 also been produced by light emitted from lime ignited by the oxygen-flame.

Of an art so new it would be premature to attempt to enumerate the advantages. Among the more obvious may be mentioned the power of utilizing the agency of any unperceived, or even in such a most complicated scenery, to be used in aid of an artist's memory for the production of landscapes, architectural re
PHYLLODOCO, a genus of plants belonging to the natural order Ericaceae. It has a 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 denticulated margins, glabrous hairy peduncles; calyce lanceolate-acute segments; petals three times as long as the glabrous filaments. The stem is from 4 to 6 inches high, determinately branched, inked below, densely hairy above. The flower is large, pale yellowish red; the peduncles terminal, aggregate, and simple. This species is found either in the north of England or in Scotland. There are three other species of Phyllodoce, which are natives of North America. They thrive only in a peat soil, and are propagated by layers. They are a genus of elegant shrubs, but rarely shrubs.

P. somnifera 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, subsessile, 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 strobex of the ancient myths, and is still used in the Middle East. It is reputed to be of great medical and alchemical value. The leaves steeped in oil are applied in India applied to inflammatory tumours, and they are used in a similar way in Egypt. Kubh recognised this plant in Egyptian mummies.

P. Alkekengi, the Winter Cherry, is an herbaceous downy plant, with a perennial creeping root; ovate deltoid leaves; spotted 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 flower 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 supplicate the double nature of the plant. The leaves have a sweet and not unpleasant flavour, but the persistent calyx with which they are invested is very bitter. Ray speaks of these berries as a preventive of gout, and others have extolled them as diuretics, and recommended them in the treatment of dropsy.

P. pubescens, Downy Winter Cherry, is a native of North America and the East Indies. It is a widespread plant, densely clothed with hairs, and bearing yellow flowers with 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, they are much relished. It is the Concora 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 hand-glass.
which place he accompanied his father in 1710, he worked exclusively for the booksellers, and became mannered, metallic, and merely ornamental. A great many of his prints are from his own designs, in which he imitated the style of contemporary Dutch and Flemish art. He taking the styles of other earlier engravers, and he published many prints of this class which are said to have deceived collectors; Pierrat used to call them Impostures innocentes, and they were published under this title, to the number of 78, with a list of his works, at Amsterdam, in 1718, after his death. His prints altogether amount to about 1500; and one of the best of them is a Slaughter of the Innocents, after a design by Michelangelo, which shows various impressions of it. During opening the Tomb of Ntirisa, 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. (Wattelet et Levenque, Dictionnaire des Arts, &c.; Huber, Manuel des Amateurs, &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° 25' and 29° 42' W. long., and between 38° 15' and 38° 33' 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 where it is wide. 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 220 square miles; which is the size of the Isle of Man.

The coast-line is formed by rugged rocks, which form no port nor allow an anchorage; at Lagens, on the south coast, is a small cove, in which small craft find shelter. The western districts face the great rocky surface of the country rises from the shores towards the peak, which occupies the centre 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 covered with a thick 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 no other cultivated crops except corn and potatoes. The soil is black and fertile. From the cultivated grounds to within a third of the distance from the summit, it is thickly covered with splendid cedars, the myrica faya, the white yew, immense junipers, myrtles, and trees-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 Calhugrass, 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 also consists of lava-rocks, it contains a much larger portion of earth than the rest, and is not separated from the country round the volcano. The southern declivities are much better cultivated than those which slope towards the northern shores, which are less covered with soil.

The vineyards are well cultivated, and lately there were annually exported nearly 25,000 casks. It is considered better than any kind grown in the Azores, and goes by the name of Faylor wine, because it is brought to foreign countries from Horta, the capital of the island. Great quantities of fruit are also sent to Faylor. Grain and pulse are grown sufficient for the consumption of the population; the onions of Faylor are much valued, and large quantities of them are disposed of to the Americans and other traders who frequent Faylor. Among the forest-trees, the cedar and white yew are greatly prized for furniture, nearly as much as mahogany, and are exported to the West Indies and to Europe.

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 months of March and the beginning of November, the rest of the year being subject to sudden changes. Showers of rain are frequent throughout the year, and the winds are subject to great changes in the winter so violent as to cause constant changes in the face of the country, washing away enormous masses of pumice from the shores and beds of the rivers, accompanied by showerings down of 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 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 overflowed the whole river course in the facility in which it usually proceeds.

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 industrious race, and are settled on the shores of the island, where they live in many white cottages, with bright, cane-reed thatched, conical roofs. The capital is Lagens, a small place built round a small cove. In the strait which divides Faylor from Faylor, but at a short distance from the island approaches the congregations of rocks. This rock, called the Isles of Magdalen, and between them Pico is an anchorage in six to eight fathoms. Opposites to them is the town of Magdelena CristoVella, whence the produce of Pico (wine, brandy, fruits) is shipped to Faylor, and where the rich inhabitants of Horta have villas.

It is not ascertained when Pico was first settled, but probably many years after 1466, when Faylor 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.

(Anhée's History of the Azores; Boldt's Description of the Azores; Von Buch's Physikalische Beschreibung der Con- rischen Inseln.)

PICI is a genus of plants belonging to the natural order Compositae, and the suborder Cichoraceae. It has an invio- lence of one row of equal scales, with unequal linear, often spreading, scales at the base; the receptacle is dotted; the fruit terete, ribbed, or furrowed, is thin, often rounded, with a pappus of two rows, feathery, external row sub- pilose. P. hieracoides, the only British species, has rough leaves, with forked and hooked bristles, lanceolate leaves, and dentate or serrate, the larvae leaving a head solitary, terminating the stem and branches, the outer involucral scales lax, oblong, bristly on the keel, glabrous on the margin. The fruit constructed just below the pappe. The flower is yellow, the caryopsis is black 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 latter 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 that his bent of mind led him to give his at- tention more to studies than to trade. Having constructed for himself a geographical globe, 20 Roman palms (about 14½ English feet) in diameter, it attracted many visitors, and among others the celebratedmathemate- cian D'Alembert, who recommended his father to send him to Rome to pursue his studies systematically under proper instructors.

He was nearly twenty years of age when he went to Rome, and, eager to make up for lost time, applied himself with arduous 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 instruction, the means for which were abundantly supplied by Vanvitelli's numerous engagements. On Vanvitelli's going to Naples to erect the palace of Caserta, he took Piammarino with him as his principal assistant in that extensive work. Again, when Vanvitelli was afterwards invited to Milan, by the Austrian government, for the purpose of altering and embellishing the palace there of bricking, the Cesarina Imperiale, for the Archduke Ferdinand, Piammarino accompanied him; and for Piammarini this proved a singularly im- portant event. Meeting with obstacles and having other engagements, he was prevented from acquainting himself with making some general designs and explaining his ideas, and recommended his pupil as fully competent to supply his place. The work was accordingly transferred to Piammarini (1769), who carried out his schemes. Piammarini established at Milan, the city destined to become the chief theatre of his professional labours, with the title of archi-
pect to the archduke, and inspector-general of buildings.

After 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 by him are the palace of the pope, Mortegita, Lancem, Sannazzari, Litta, Cusani, and the magnificent and extensive façade of the Palazzo Belgioioso; also one of the fronts of the architect's palace. Among his public buildings are the Monte di Pilgr, the Monte Napoleon, the Longhi Pil, the Teatro della Canobbiana, and the Fora Orientale, his designs for which were adopted in preference to Cagnola's. [CAGNOLA, F. 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 Contrada di S. Redegonda; which to may be added the Public Gardens and their buildings. Nor were his labours confined to these, as many of the ancient imperial villa at Monza; also of the Villa d'Adda in Cassano, and of the Villa Cusani at Desio, at which place he improved and completed the church.

Since his youth 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, among which, amongst others, are works upon art. There he died, February 18th, 1608. The Academy of the Brera, at Milan, honoured his memory with a monument in the portico of its building.

(P. V. Veronese, in Velasso, Biografie, &c.)

PIG. [HOG, F. C.; SUDDE, F. C.]

PIG-NUT. [BUNN, F. 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 Lorrain and the elder Lemoine, 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 proposed to send it to Madame du Barry, which he was unwilling to consent to. On the other hand, the material for the Venus was of the most extraordinary quality, and the king proposed to make a copy of it. Pigalle was induced to make the Venus, and the statue was exhibited at the salon of 1745.

PIGALLE'S VENUS, which is now in the Louvre, is one of the most celebrated statues of modern times. It is a group of the statue of Venus, and the personification of the female figure, and is placed in the centre of the room. The Venus is represented as reclining, and is supported by a column, on which is a figure of Mercury. The statue is of marble, and is of the most exquisite workmanship. It is a fine example of the power of the French school of sculpture, and is a proof of the taste of the king, who was averse to the Egyptian and Greek style, and preferred the Roman style.

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PISTANO is the surname of several distinguished artists of Pisa in the thirteenth and fourteenth centuries. Pisa, Niccola, Giovanni, and Andrea Pistano. Of two of these artists, Niccola and Giovanni, some account is given in the Penny Cyclopedia. Andrea Pistano, the third of the name, was born at Pisa in 1329. Vasari commences his "Lives of Artists" with Cimabue, and there were several Tuscan artists anterior to Cimabue, especially at Sienna and Pisa. [Tuscan School of Painting, P. C.]

GIUNTA PISANO was one of the principal of these three artists, and is the earliest known Tuscan painter; Niccola was a sculptor, and Giunta appears to have preceded him for a time, though Vasari has erroneously put him in another group, and 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 Basilica of Assisi, by Peter Angell, who says, "Janetta Pisanus riditet a Graecis historiae primum ex Italii artem appetit comprehendit circa annum 1210."

Giunta appears to have attained considerable reputation, for Pisa. Elia of Cortona, general of the Minorities, invited him and his son to Assisi, to execute some 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 1214, and the predella of the so-called "Assisi Elia." These 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 dell'Albergata, by Giunta, remarkably solid in impacto and unaffected by water; it was painted probably about 1236, and has the following inscription upon it, according to the restoration suggested by Lanzi: "Juncta Pisanus junctaque sorsam Giuntai di Assisi commentavit domini," the name, from the occurrence of this name in an old MS. mentioned by Morrona in his "Pisa Illustrata." Other existing works ascribed to Giunta are—a Crucifixion in San Miniato al Monte 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 Lanino in the "Etruria Pittor" of Lastrici). The Campo Santo was built or commenced by Giovanni Pisano in 1278. (Archaeologia, vol. xxxi., pt. 1.) Giunta was contemporary with Guido di Sienna and Bonaventura Berlinghieri of Lucca; and all belong to the Byzantine school in style—brownish colours, positive compositions, exaggerated features, and a coarse line with hatchings for the shadows, and elongated extremities, even with occasional short thick figures; but their forms are generally attenuated and emaciated. This degenerate form however had an historical 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, said Lanzi, faults of the times rather than of the men. Mr. W. Y. Ottley possessed an old Italian distraster picture of the Crucifixion, which he supposed was a work by Giunta. Vasiari has omitted the Life of this painter. There is no notice of him later than 1326, but he may have lived some time beyond that date. 1821.

ANDREA PISANO was another early artist of Pisa, but nearly a century later than Giunta and Niccola Pisano. He was born in 1260, was distinguished as architect and sculptor, and celebrated as an earlier founder, in 1316, of the first of his age. He is said by Vasiari to have imitated the design of Giotto in the Campo Santo. He was invited early to Florence, where he executed several celebrated works. The most important seems to have been for the Baptistry, for the façade of Santa Maria del Fiore; they are now, with other works by Andrea, in the Strozzi garden on the Volonda; the pope is engraved in Cicerone, Scipione, and Sella. Vasari describes the colossal Madonna and Child, and the two accompanying angels, in marble, in the chapel della Misericordia of the Piazza San Giovanni at Florence, but this was the work of Alberto di Arnoldo in 1304; the error was detected by Vicenzo Follini: the documents are given by Cicognara and Rumohr. The half-figure of the Madonna above a side door of the Misericordia, on the wall of the Chalidrop, is the work of Andrea Picciotto. Andrea was also appointed, contrary to his usual custom, he imitated the antique. Andrea's great work in sculpture, however, was the bronze gate for the Baptistery of St. John, which he undertook to make from a design by Giotto. It was completed in 1325, during the pontificate of John XXII. He had a few years previously sent Pope Clement V. (1305-1314), through Giotto, a bronze crucifix as a present, and the excellence of this work led to the important commission to model and cast two of the bronze gates of the Baptistery, which, after the lapse of twenty-two years, says Vasiari (Baldinucci says eight years). In 1339, with the assistance of his son Nino, he successfully accomplished; not that he was all this time exclusively occupied on this work, for he executed many others in the meanwhile. The sculptures are from the life of John the Baptist, and were gilded, and the gates were fixed up in the central entrance to the Baptistery; but upon the completion of the much more excellent gates of Ghiberti, they were removed to one of the side entrances, and those of Ghiberti were put in their place. The year 1339 in Vasiari appears to be a misprint; for, according to most good authors, the gates were the following: Andrea Ugolini Nini de Pisa me fecit anno domin. MCCXXX. (Cicognara, Storia della Scultura, iii. 396; and Lasinio, Le tre Porte del Battistero di Firenze, Florence, 1823, in the Pisa Library, there are some works of the period). But this date, according to Giovanni Villani, one of the superintendents of the work, is the year in which they were commenced; if therefore they occupied twenty-two years from this time, the year 1325 could not be correct. The work was done by Venetian artists, the model only being finished in that year; they may therefore have occupied twenty-two years from the commencement of the model to the completion of the cast of the gates, which was done in two years, after Giotto's return from Avignon, as the date of the commencement of the work, which is quite probable. As an architect, Andrea designed the Castello di Scarperia in Mugello at the foot of the Alps; and Vasiari says, according to report, the Arsenal of Venice, where he spent a year; he raised part of the walls of Florence eight ells in 1316; he designed the church of San Giovanni at Pistoia, commenced in 1337, and he executed many works for Guido, duke of Athens and tyrant of Florence, until the duke was expelled from Florence in 1343. Andrea was murdered on a visit to Florence, and had other honours conferred upon him. He died in 1345, and was buried in Santa Maria del Fiore, where his son Nino raised a monument and placed the following inscription to his memory:

In gentem Andreae natus hic Putane in urbe,
Marmore quo pictae emplures doceat valvis.
Ex similibus Deum media impone templis
Ex arbo, ex arbo undantem et palatis elephante.

Nino completed the unfinished works of his father, and executed many original works of merit. Tommaso Pisano, another pupil of Andrea, is supposed also to have been his son. (Vasiari, Vite de' Pittori, &c., and the notes to the German translation by Schorn; Lanzi, Storia Pittorica, &c.; Cicognara, Storia della Scultura; Köbler, Kunsthallt, 1827; Bembo, in the "Bollettino delle Scienze Archeologiche di Napoli, Storia de' Pittori, &c.,"

PISCARY. [FISHERS, P. C.]
PISCARY (from pieces, a fish, and eel, to kill or destroy), a fish, a large common species of the genus minocyclus. It has a campanulate 5-leafed calyx, an obtuse keel, and a papilionaceous corolla. The stamens are monadelphous, with the tenth one free at the base. The style is filiform and smooth, the ovary 3-celled, and St. Paul, from designs by Giotto, for the façade of Santa Maria del Fiore; there are now, with other works by Andrea, in the Strozzi garden on the Volonda; the pope is engraved in Cicerone, Scipione, and Sella. Vasari describes the colossal Madonna and Child, and the two accompanying angels, in marble, in the chapel della Misericordia of the Piazza San Giovanni at Florence, but this was the work of

P. erythrina (Dogwood) is a tree about twenty feet high. The leaves are in pairs, from 3 to 4 together; they are oblong or obovate, rounded at the base, downy on both sides
machinery was made, according to Nicholson's Architectural Dictionary, by General Bentham, who patented a plan in 1791 for a contrivance by which large planes, wide enough to take the whole width of a plank at one stroke, and supplied with apparatus for directing their course, regulating the depth of the cut, and generally effecting the necessary degree of skill and judgment on the part of the operator, might be worked either by mechanical power or by manual labour. The machine was used for a time, worked by hand, but did not succeed well. A patent was obtained in 1803, by a person named Berens, for a similar apparatus for planing, or, to use a technical term, 'sticking, mouldings, reliefs, grooves, &c. The improved principle, now generally adopted, of making the wood to be planed to adhere closely to the teeth of a 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 various teeth it is said 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 is said to be used as a table-leaf, as it would be useless to throw it into pure sea-water, and neither its flavour nor wholesomeness is in any degree impaired. The same gentleman made a series of experiments on himself as to the effect of a mixture of opium and ferrum phosphoricum on the tooth and gum, and hence the genus of P. Carthaginis is a native of Jamaica, Guadaloupe, and Carthagea, on the mountains. It closely resembles the former species, and is scarcely distinguishable from it. These trees are also much more commonly rootage of them may be rooted in sand under a hand-plant in heat.

(Don, Gardener's Dictionary; Lindley, Flora Medica; Burnett, Outlines of Botany.)

**PI. DUSS**, a genus of fossil fishes from Shoppey.

**PITSTRIP.** [Stigma, P. C.]

**PISTON.** [Steam-Engine, P. C.]

**PITCH-PLANT.** [Lep. P. C.]

**PITUS, a genus of fossil plants from the Carboniferous strata of Tweeddale. (Within.)**

**PLANE: PLAINING THE MACHINERY.** Of the planes commonly used by carpenters and cabinet-makers for levelling and smoothing the surface of wood, an account is given under *JOSEXT, P. C. S., p. 123, where the use of what is termed a double-iron is briefly alluded to. This improvement, which has been in common use for many years, is not found sufficient, in all cases, to meet the difficulties which arise in planing hard and coarse woods. To remedy this defect Mr. C. W. W. Thomas has invented and obtained a patent for the same in 1825, where he terms a double-bevelled plane, in which a single iron is used, but it is made thicker than those of ordinary planes, and its edge is produced by two bevels instead of one, and what is more it is made with an inner edge of which is 'much stronger, will retain its keenness much longer, and will cut much smoother' than any other plane known to its inventor. This modification of form has the further advantage of lessening the weight of the finest cast-steel for making the plane-iron; whereas the comparative weakness of plane-irons of the ordinary make had presented serious difficulties in the way of applying that material, although it is known to be preferable to any other for cutting-instruments.

A fuller account of this invention, coincided with a testimony as to the superiority of the improved plane for use in smoothing box-wood for the use of engravers, is given in the Society's Transactions, vol. ii. pp. 80-85. In the preceding volume of the same work (pp. 83-85) is a description of an ingenious contrivance rewarded by the Society in 1824, to make one plane answer the purposes of the jack-plane, the panel-plane, the smoothing-plane, and the moulding-plane, by having the bottom, or sole, of the plane moveable, and attached to the body of the stock by means of a dovetailed groove. By this contrivance a workman may have several different irons or blades, and any number of different soles, made either flat like those of an ordinary plane, convex or concave in different degrees, either longitudinally or transversely, for planing curved surfaces, or adapted to the form of an ordnary sole plane, and hence it is said to be useful in effecting a great saving both in expense and portability. This contrivance is the invention of Mr. G. Gladwell, who, like the author of the double-bevelled plane, is described as a wood-cutter.

The first attempt to economize labour by means of planing-
PLANTIN, FOSSIL. The progress of knowledge concerning the vegetable which in ancient geological periods covered the surface of our planet has been, until within the last few years, neither rapid nor sure. No small amount of time and patience was required to establish the conviction that organization, not crystallization, was indicated by the wood, leaves, and fruits which abound in the stratification of Europe. Much profound investigation of the natural orders of plants was an indispensable preliminary to the reference of even perfect specimens of fossil plants to their living congeners, and microscopic scrutiny of the minutest tissues could alone determine in fragments of petrified wood the essential characters of primaval trees.

These investigations have been so far advanced by eminent living botanists, that a very great proportion of fossil plants has been satisfactorily referred to the proper classes and great orders, and in some instances to the true families and genera. On this basis, furnished by physiologically botanical grounds, we are in a position to understand the very remarkable speculations—inferences concerning the succession of vegetable life, and the varying distribution of land and sea; and speculations concerning the ancient climate of the surface of the globe, and the ancient chemical constitution of the atmosphere.

Passing over, but without approval, the earlier labours of Steinhausen, Parkinson, and Artis, in England; of Dodoens, who first published the most important doctrine of fossils, in Belgium; of Linnaeus and Agathis, in Sweden, we may safely attribute to M. Adolphe Brongniart the advanced position among the natural sciences which is conceded to fossil botany. Guided by views of fundamental utility at once profound and practically applicable to the subject before him, this zealous naturalist, by personal observations over great part of Europe (1826 and following years) and by communications from many distant places and shores of the world, has established that body of information which is the basis of his two great works, viz. : the 'Frodome d'une Histoire des Végétaux Fossiles,' 1829; and the 'Histoire des Végétaux Fossiles,' which occupied many subsequent years.

A somewhat parallel but less extensive inquiry has since been undertaken in England by Dr. Lindley and Mr. Hutton (Fossil Flora of Great Britain, 1831-36); Géppert (Systema Fossilium Fossilium, 1836), has revised the numerous tribes of fossil ferns; Mr. Bowerbank has collected extensive information concerning the fossil fruits of the London clay, and we are indebted to Dr. Brown, Mr. Witham, Mr. Bowman, Mr. King, and other English naturalists, for a mass of valuable particular tribes of fossil plants. Mr. Morris has combined in his catalogue a summary of the results for the British Islands.

Previous to the year 1839 there hardly can be said to have been specified, excepting in general systems, the types of the particular tribes of fossil plants. In the Frodome of M. Brongniart appeared (p. 219) 501 fossil plants, while the recent tribes were estimated at 50,350. In 1845 Mr. Géppert estimated the known fossil plants at 1795, and the recent species at 80,000. (Reports of the British Association.) Following the classification of M. Brongniart, we find his 501 plants thus divided and compared with living tribes:

<table>
<thead>
<tr>
<th>Fossil</th>
<th>Recent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7,097</td>
<td>2,000</td>
</tr>
</tbody>
</table>

Agamia  
Cryptogama cellulae  
Cryptogama vasculess  
Phanogamia gymnostoma  
Phanogamia dicotyledoneae  
Phanogamia dicotyledoneae

It thus appears that the vascular Cryptogamia numerically constituted about half the fossil flora known in 1828, while among living plants they count only as 1 in 30; and the dicotyledonous group, which includes more than half the recent plants, is represented in the stratification of the globe by one-fifth. These results, though modified by later discoveries, are still firmly established. Are we to conclude from this statement, that the vegetation of the ancient world was entirely different in its general organization and constituent classes from the actual flora? Do the plants which we collect in the strata truly represent the entirety of the
Among and great several or actuaries, not siled into the very ferning and assurance. Taking to the extent to the fourth period, we have added the original, and added the general terms Palaeozoic, Mesozoic, &c., in conformity with the views advocated in this work.

<table>
<thead>
<tr>
<th>Period</th>
<th>Acrozoic</th>
<th>Cymodocea</th>
<th>Phyllospadix</th>
<th>Thalassa</th>
<th>Cenozoic</th>
</tr>
</thead>
<tbody>
<tr>
<td>First period</td>
<td>2700</td>
<td>1500</td>
<td>1700</td>
<td>150</td>
<td>8000</td>
</tr>
<tr>
<td>Fourth period</td>
<td>15*</td>
<td>2</td>
<td>7</td>
<td>17*</td>
<td>25*</td>
</tr>
<tr>
<td>Third period</td>
<td>3</td>
<td>0</td>
<td>31</td>
<td>35*</td>
<td>3</td>
</tr>
<tr>
<td>Second period</td>
<td>7</td>
<td>0</td>
<td>8</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>First period</td>
<td>4</td>
<td>220*</td>
<td>0</td>
<td>16</td>
<td>0</td>
</tr>
</tbody>
</table>

Hence it would appear that vascular Cryptogamia had their greatest predominance in the first (Palaeozoic) period; that gynospermuus Phanerogamia acquired their greatest development in the third (Mesozoic) period, while true Monocotyledones probably arrived in the second (Cenozoic) 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. 2) 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 undisturbed by the ocean sea, the specimines being placed 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 in water, 121 not to be traced. The numbers were thus proportioned in several natural groups:

- Acrozoic
- Dicyotyledons
- Dicyotyledons polypetalae
- Dicyotyledons monocotylea
- Monocotyledones

Among the Acrozoic the recognisable families were mostly Filices, and Lycopodiacese, these being frequent in a fossil state. Among the Dicyotyledones the recognisable plants were numerous, especially in the Coriaceae, and these abound in a fossil state. With these exceptions, the Dicyotyledonous plants tried were, in general, unable to remain for two years in water without being totally decomposed. The Monocotyledonous plants were found more capable of resisting the action of water, especially Palms and Scatamimous 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 under which the fossil plants were buried in the sections were the same as those now, we should consider as certain the results 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 ancient vegetation of the globe. But we may not wish to go so far in our assurance. On the contrary, in very many cases there is little room for doubt that the plants were speedily enveloped in mud, and never had time to become fossils. They appear in fact to be a fair sample of the vegetation which actually prevailed on or near to the spots where they are found buried, and were subject to be drifted for that distance by the water in which they were deposited; 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 Palaeozoic, Mesozoic, &c., in conformity with the views advocated in this work.)
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 flora, the inferences from the coal-flora agree sufficiently. Substituting coal-flora, which abounds in these, for the lycopsid and carnotids in those, we have a parallel series of results. And warmth of climate appears still to be indicated by the seed-vessels of Piperox, &c., which occur in the London clay. In harmony with these data which are here generalized, into the inference of a warm climate prevailing in the northern zones of the world, even into the Cainozoic periods, is a parallel series of data and inferences derived from the contemplation of the perishable 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 many workable beds, as to have absorbed the growth of plants on an equal area for hundreds of centuries, if that growth was after the rate it is supposed to have occurred in temperate or 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 so far allotted may be conceived to be reduced.

M. Brongniart 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, and the cessation 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 contemporaneous 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 1843), the names of 592 species of fossil plants, distributed in 107 genera or families, are given. We propose to enumerate these genera and show their geological distribution so far as relates to the British Islands, according to the classification developed in the Cyclopaedia (Palaeozoic Strata, P. C.; Sylleptic System, P. C.) and exemplified in the article on Fissura, Fossor, P. C. S.

**General Distribution of Fossil Plants.**

Tab. I. In British Strata:—

<table>
<thead>
<tr>
<th>Order</th>
<th>Number of Spec.</th>
<th>Number of Spec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyperites</td>
<td>615</td>
<td>105</td>
</tr>
<tr>
<td>Euphorjea</td>
<td>776</td>
<td>105</td>
</tr>
<tr>
<td>Poaceae</td>
<td>279</td>
<td>105</td>
</tr>
</tbody>
</table>

For comparison we add M. Glüpp's statement of the numbers of plants in corresponding strata obtained from all parts of the globe:—

<table>
<thead>
<tr>
<th>Order</th>
<th>Number of Spec.</th>
<th>Number of Spec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyperites</td>
<td>615</td>
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<td>105</td>
</tr>
<tr>
<td>Poaceae</td>
<td>279</td>
<td>105</td>
</tr>
</tbody>
</table>

In both estimates the Palaeozoic Plants are more than four times the number 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 Fossils, Cyperites, Cyathan, and Fucoids in British Strata:**

<table>
<thead>
<tr>
<th>Strata</th>
<th>Fossils</th>
<th>Cyathan</th>
<th>Fucoids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cainozoic</td>
<td>0</td>
<td>0</td>
<td>0, 2</td>
</tr>
<tr>
<td>Mesozoic</td>
<td>51 27</td>
<td>12 6</td>
<td></td>
</tr>
<tr>
<td>Palaeozoic</td>
<td>105 0</td>
<td>10 0</td>
<td></td>
</tr>
</tbody>
</table>

**Tab. III. Geological distribution of certain genera of plants:**

<table>
<thead>
<tr>
<th>Strata</th>
<th>Names of Fossils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cainozoic</td>
<td>0 0 0 0 0 18</td>
</tr>
<tr>
<td>Mesozoic</td>
<td>13 0 11 0 0 2</td>
</tr>
<tr>
<td>Palaeozoic</td>
<td>21 22 31 20 2 1</td>
</tr>
</tbody>
</table>

**General series of the genera of British fossil plants:**

**Cyperites.**

<table>
<thead>
<tr>
<th>Strata</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cainozoic</td>
<td>12</td>
</tr>
<tr>
<td>Mesozoic</td>
<td>2</td>
</tr>
<tr>
<td>Palaeozoic</td>
<td>1</td>
</tr>
</tbody>
</table>

| Ablis | 2 | Poepoitera |
| Alecthopterus | 2 | Pooica |
| Acanthagmites | 1 | Phloeopterus |
| Brachyphyllum | 1 | Pteropterus |
| Becklandia | 1 | Podocarya |
| Carpholithes | 5 | Polypodiales |
| Chondrites | 3 | Polystichites |
| Clathriaria | 1 | Pteropteris |
| Convolvulusses | 2 | Rhodea |
| Cycadites | 1 | Sphenopteris |
| Cyclopteris | 3 | Sphenopteris |
| Dicotyledonites | 2 | Solenites |
| Dracanae | 1 | Speraeae |
| Echinostachys | 1 | Sphenopteris |
| Endegrogenites | 2 | Solenites |
| Equisetites | 3 | Spheroptyeris |
| Fucoides | 2 | Taxis |
| Hynemites | 1 | Thelypteris |
| Lepidopteris | 1 | Thuletes |
| Lycoptides | 1 | Tynpanophora |
| Otopteres | 4 | Walchia |
| Pachypteres | 2 | Zamites |
| Palaeozaan | 8 |  |

**Palaeozoic Strata.**

<table>
<thead>
<tr>
<th>Class</th>
<th>Orders</th>
<th>Genera</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allopterean</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Anthophyta</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Annularia</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Anthophyta</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Aplophyllophora</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Brachyphyllum</td>
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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, centre-pieces, 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 Encyclopædia Britannica, among the most important, is that of the plasterer; and he further remarks that the application of the coat of stucco to the exterior and interior surfaces of houses, and the drawing of the brickwork, is done to produce a similar effect by interposing narrow fillets between them and the laths. The projections and panelled compartments in a plastered surface are provided for by bracketing 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 is to be used only two coats, which, when upon laths, is technically called kind and set, the first coat, or the laying, is levelling with the trowel, and when sufficiently dry, the surface is scratched up or roughed with a bird-brush, and a thin coat, or set, of finer plaster is laid on and smoothed with the trowel, assisted by a wet bristle-brush to moisten such parts as are intended to receive the next coat. In one or two cases, where this method is not necessary, a 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, smoothed with their hands; the second coat is applied, 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 carefully and judiciously levelled. The degree of 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 intervening spaces or bays are filled up with them, the plaster being very carefully adjusted to the required surface, by means of flat wooden instruments called floaters, made with one or two handles (the latter being called Derby floaters), and stragi-lut-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 swept over, and the third coat of a similar proportion, but the 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, or by the use of the plasterer's trowel, to be made absolutely 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 and delicate finishing, we are reduced to the ordinary instruments for painting, and in this case, the plasterer must, however, refer the reader to the articles on the subject in Nicholson's Architectural Dictionary, and to that department of the article Building in the Encyclopædia 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, macerated so completely 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 delicate variety of fine stuff, with the admixture of a little hair. Surfaces intended for painting are finished, or set, with bastard stucco, which is composed of two-thirds ordinary fine stuff, without hair, and one-third very fine clean sand; and these are finished with 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 often spoiled by the presence of muddy earth, which, although decayed and readily soluble, is sometimes mixed with the lime and cement, to which causes of failure may be added the occasional presence of argillaceous matter either in the lime, sand, or powder of the cement itself.

"These things ought," Mr. Hosking observes, "to be excepted for a long time, if the work were well protected from..."
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 accurately fitted and crowned, so as to make it close and compact; but the evil arises from exposure above, and from the numberless horizontal unfoiled surfaces which are constantly presented,' which receive and detain the water until the earth is saturated, when either from excessive and bottomless rain or from wet weather, which calls in the open air, or warmth calls the vegetative power of its impurities into action, so that it becomes covered with minute vegetation. Hence it insists on the importance of excluding road-drift, (unless that is specially formed by the finest and vegetable 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 course stuff, under the impression that, as 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 trowelling the upper horizontal surfaces of all projections.

**Rough-cast** is a cheap mode of stuccooing adopted in inferior buildings, where there are good projecting eaves to keep the walls dry, consisting of two coats of course lime and half a coat 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, and washed immediately with an ochreous colour.

Mouldings or cornices are formed by a core or foundation, either of brackets and laths, or in some cases in external work, of projecting bricks and tiles. Very trifling projections may sometimes be supported sufficiently by a few projecting bricks or tiles, a large layer of course stuff and a small layer of stucco 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 present form is often given by running 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 so as to be a perfect counterpart of the profile of the moulding to be formed, and to this, when dry, is applied the closer composition of which the moulding is to be formed, as nearly as possible in the required shape.

**PLENARY** is a genus in the family Malpighiaceae, order Malpighiales, native to the Americas. It is known for its yellow flowers and woody fruit, which is used in traditional medicine.

**PLATENSIS** is a species of flowering plant in the family Caprifoliaceae, native to Europe and western Asia. It is commonly known as the wild rose, and is known for its pink or white flowers and spines.
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 Zoffanie, A. Vandernevel, Rembrandt, Ostade, Van Campen, Vandrick, Van Goyen, Coops, and others, engraved by M. Berthelin, M. Berlio, A. Bloemart, G. Visser, Wouerman, P. Scenredam, Van Mander, Flink, Brouwer, Miera, Terburg, D. Steen, Do Bray, and others. The illustrations together 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 taken of any. They are enumerated and described by W. van Eynden, in his "Van Eynden's Kunstkrant," and in "Kunstchronik," by a. Bloemart, in "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. Jos, 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, 1708, and on March 3rd, 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 were pleased at seeing, for the first time, those stones carefully engraved with various plates, and he accordingly drew some impressions in the presence of a deputation of the Dutch Academy of the Sciences at Haarlem in 1768, which decided the question of the priority of his discovery.

(Van Eynden en Vander Willigen, Geschiedenis der Vaterlandse Schilderkunst sedert de heft der XVIII. Eeuw, 1816-42.)

Being the common size, 'grass,' a genus of Grasses belonging to the tribe Festucineae. This tribe is characterized by very short styles, protruded stigmas, and the glumes shorter than the lowest flower. The genus Poa has its glumes rather unequal; the outer pair, with 3-4 nerves, membranous below, scarious at the tip, compressed, keeled, unarmed; the styles terminal. The species of this genus are very numerous, constituting the commonest weeds that follow the migration of cattle. Poa has been so sufficiently treated in the families of the Poaceae, and it is employed in the preparation of feed for various animals.

Thirteen species of this genus are described by Babington as natives of the British Isles. 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-walked meadow-grass, and is found in most pasture lands. P. meadow-grass, is also a common grass in shady places. Many of the recent genera of Grasses were formerly referred to the genus Poa.

PILLY, FRANCOIS, a distinguished French engraver, was born at St. Malo, in 1695, and died in Paris, June 1, 1770. He was the pupil of M. Daret, and studied some time in Rome. He adopted the somewhat hard style of engraving of Bloemart in direct crosses, in which he was completely successful: his drawings also perfectly answered the desiderata of an accurately and finely executed engravings. 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 master-piece is the print from Mignard's celebrated picture, now lost, of San Carlo Borromeo administering the Sacrament to the Milanese attacked with the Plague. A catalogue of his prints was published by R. Beauge in 1750; it comprises several after Raphael, including the Viaje a Berellus, the Viaje a Llueye, the large Holy Family in the Louvre, and other Holy Families by Raphael. Poilly died at Paris in 1695. His brother Nicolas and nephew Jean Baptiste Poilly were likewise distinguished engravers, the elder in medallions, the latter in portrait medallions, and in engraving busts of great personages. They both died in Paris.

POINING, in the law of Scotland, is a process for enforcing payment of a debt, against the property of the debtor. It is divided into 'personal poining,' and 'pointing of the ground.' The former is the method by which any security of the kind of interest in land is or may be secured, the latter is peculiar to the holders of real rights over estates belonging to others—to be superior entitled to feu duties or the holders of real securities entitled to payment of the interest due thereon by the possessors of the estate, and to pay themselves. Personal pointing 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 owe their lives to the death of persons conversed with poisons, 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 means of procuring a cure from them, gave persons other diseases, gave to persons who bad accidentally discovered a poison a great power, and offered a temptation to crime. In ancient history many instances are recorded of persons who became known as poisoners, and are supposed to have been secretly poisoned. Beck in his 'Medical Jurisprudence,' says that 'Theophrastus speaks of a poison prepared from aconite 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.' During the middle ages, many similar poisons were used, and they were greatly employed for the purpose of administering poisons whose powers were known to be strong. There was a general belief that death is obtained, it is supposed, from the aconite, hemlock, and poppy. One of their animal poisons is said to have been the acid juice secreted by a species of Tettihannita mollusce, called the sea-hare, and the apodea of Limenius. 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 incidents has been exaggerated. Many instances have been reported of persons being killed by supernatural powers, that it is sometimes difficult to distinguish between the true and fictitious. The aid of poisons appears sometimes to have been resorted to obtain for the powers of the witch and the wizard. A singular combination of poisons was discovered at Rome during the pontificate of Alexander VII. in 1659. It was observed that many young married women became widows, and that many husbands died who were known to have become disagreeable to their wives. Great exertions were used to detect the poisons, when at length suspicion fell upon a society of young wives whose president was an old woman who pretended to foretell future events. Their society at that time consisted of a great number of persons. At length the society was detected, arrested, and every member put to torture, and the old pres- ident, by name Spars, with four others were publicly hanged. A large number of women who lived at Palermo and afterwards at Naples. The poison used by Tofana was the name of Aqua Tofana [Aqua Tofana, F. C.], but its composition was never accurately made known.

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 Brétvilliers. She formed an improper intimacy with a villain named Sainte Croix, who taught her the art of poisoning, which she put in practice in order to better her circumstances. For the purpose of ascertaining the strength and effect of the poison, she boiled some lard or tallow, shed the poison, and distributed food to the poor, nursed the sick in the Hotel Dieu, and administered to them her poisons. She poisoned her father and brother, but was last discovered. She was publicly beheaded in Paris on the 16th of July 1676. She left behind her a complete catalogue of all her crimes. The principal poison used by herself and accomplices was the corrosive sublimate. The practice was extended so widely in France that the government thought it necessary in 1679 to institute a court under the title of Chambre de Poison, or Chambre Ardente. The powers of this court were extended, and very shortly after its institution it was suppressed.

Wherever evidence has been left sufficiently positive 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 the trade of poisons take place.

In this country we have recently seen an instance at Hapsburg in Norfolk, where, from the neglect of inquiry, a man succeeded in poisoning at different times his wife, two grand-daughters, and a number of his neighbours, amounting in all to 16 or 18 people, and eventually himself without discovery till after his death. Secret poisoning is at the present day practised in Turkey. Mr. Maddox says, that whilst residing in that country he witnessed eight cases, in most of which death ensued within twelve hours, and in all within forty-eight hours. It is not uncommon amongst uncivilized nations. Dr. James, in his account of Major Long's Expedition, says, that 'The celebrated 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 him for this purpose by the villany of the traders.'

(Beckmann, History of Inventions; Beck, Medical Jurisprudence; Adams, Edinburgh Medical and Surgical Journal, vol. xx.)

POISSON, SIMEON 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 in 1794 as a student of the École Polytechnique. 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, that in which the latter had laboured in the class, 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 Baron, officer of the legion of honour, répétiteur-adjoint and permanent examiner of the Polytechnic School, member of the Council of Public Instruction, and of the Academy of Sciences, April 20th, 1852.

As far as so few words can go, it may be said that the labours of Poisson were directed to the introduction of the use of definite integrals into all branches of mathematical physics, and the extension of the various branches by their means. There is nothing out of which to make a popular reputation; the successes of Poisson are all purely mathematical, and none but the mathematician can as much understand the description of them.

The greater part of the writings of Poisson are contained in various periodicals, particularly the Memoirs of the Institute, the Journal of the Polytechnic School, the Annales des Sciences Mathématiques, and the Mémoires de l'Académie des Sciences. There is hardly any subject on which they do not treat, and almost always with decided success; electricity, magnetism, heat, gases, capillary attraction, gravitation, the pendulum, &c. &c. &c. In no branch of science does the mind of a mathematician of our time manifest more of the analytic and synthetic in a well-written paper by Poisson. 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 necessitated.

Poisson's separate works are—1. 'Traité de Mécanique,' Paris, 1811, 2 vols. 8vo.; second edition, Paris, 1833, 2 vols. 8vo. Perhaps this is the best elementary work on the 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 examples, but have not the analytic and synthetic in the same degree. 2. 'Traité de l'Action Capitale,' 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 surface of the capillary column of fluid. 3. 'Théorie Mathématique de la Chaleur,' Paris 1835, 4to. The data from which Poisson starts are derived from the experiments on the nature of heat, made subsequently to the time of Fourier, his pupil; in this branch he is the successor of de l'Action Capitale, Paris, 1831, 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 some partial substitution of definite integrals for series, there is little advance, mathematically speaking, upon Laplace; but the application to questions which he had never met, in a new point of view. Accordingly, Poisson 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 Poisson was unable to properly finish this task, and several remarks, 4. 'Polanista' from 1492, many, and vulgar, unequal; stamens numerous and unequal, a genus of plants belonging to the natural order Caryophyllaceae. It has 4, sometimes 5, sepals, 4 petals, a small torus; silique sessile within the calyx or hardly stipitate, terminated by a distinct style. P. leontandra has a stem covered with viscid glandular hairs, 3 to 5 foliaceous leaves, the leaflets oblate, conicus, or oblong subacute, scarcely longer than the petiole. 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 Cochin China as a counterirritant in the same way as staphisagria in Europe, and as a vesicant. The root is used as a vermifuge in the United States of America. P. flavens is a plant bore with glandular hairs; it has trifoliolate leaves, elliptical oblong leaflets, from 8 to 12 stamens, oblong silique narrowed at the base, glandularly mucronate and pubescent. It is native of North America, and is employed as a mouse poison. 5. 'Polarization,' (Circular Polarization, C.F.C.S. Eclipse, 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 M. Arago having observed that a polarized beam of light is not capable of transmission by a millicolour, he supposed that the application of a magnetic or electric current to the plate would cause 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 alternations, first one and then the other of two particular planes of polarization.

Consistent with 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 after transmission and reflection in air.

The phenomena of transmission and reflection in glass, and the phenomena of refraction and reflection in other media, are in a way parallel to the effects observed 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, these intervals being, however, much greater than those of Newton for the same reason; viz. as the rays are at right angles to the plane of the polarizer. Furthermore, the axis of polarization is not only a 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 situated in the plane, and so on.

In the same kind of crystal the values of $\epsilon'$ 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 and the oscillatory action is supposed to cease when the luminous particles quit 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 mica, beryl, rock-crystal, Iceland spar, and many other crystals, are the same as those presented by sulphate of lime, except with respect to the thicknesses at which the periodical variations of the tints take place. The last of these depend entirely on the laws explained by 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 polar towards which the planes of 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 (Polarized Rings, P. C. S.) are produced, yet it is known to them in many respects to be inadequate. The necessity of the presence of a definite section of crystal to produce 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 the plate, having its vibration plane 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 perpendiculars 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 crystal secundaries; in this case the ordinary and extraordinary rays being exactly equal in thickness, 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 of the rays within the crystal be an exact odd multiple of half an undulation, the waves at their egress will be in discordance, and the resultant ray, at emergence, will be another polarized ray in a plane making an angle with the plane of the incident ray equal to twice at which the principal section of the plate is inclined to the plane of primitive polarization.

POLARIZED RINGS. Between the year 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 passes 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 colours of images, which take place when polarized light is transmitted through plates of mica; and in 1812 Dr. (Sir David) Brewster had 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 both in bi-axial 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 ample materials for determining the laws of these 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. Sebeck 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 transmitted through a plate MN (Fig. 1) which is made of two plates of glass either parallel or inclined to the horizon; (a plate of obelidian or a pile of glass plates placed one on another may be employed) its posterior surface being blackened; and let ABC be the axis of a slender pencil of light from the clouds or from a lamp surrounded by unpolished glass, and let it fall on MN at an angle of incidence equal to 50° or 45°, 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 let it fall on PQ at an angle of incidence: 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 blackened plate, 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 BIF in the direction of the ray AB produced.

Agreeably 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 the figure, so that the course SABC of the ray is in one plane (suppose vertical) and no object is placed in the direction of the pencil AB, the vibrations will take place after reflexion 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 ABF, the perception of the reflected light diminishes; and when the base PD is perpendicular to its first position, in which case the planes 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 the reflection.

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 K in the direction of the pencil AB, the former state of the plate of light 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 a white and greenish hue, of different colours produced by the birefringence of the crystal. 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 uni-axial crystal 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 perpendicular 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...
made on blue topaz: a plate of this mineral being placed, as at 1 K (Fig. 1), and the analyzing plate PQ being turned round on BP till PD was at a vertical position, that is, all the plane ABC was at right angles to SAB, there appeared a system of rings, apparently elliptical with a rectilineal band quite dark in the direction of the major axis: the colours of the rings appeared constantly to those of the former series, or, apparently similar to those of Newton’s rings when seen by reflection. But, 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 mica 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 perpendicularly to a line bisecting the angle formed by the optic axes.

Now, if a plate of any biaxial crystal, as mica, nitre, &c., be placed as at 1 K 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 that in which the crystal 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 is 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 polar points P and P’ (Fig. 3) become one straight line MN; the coloured rings come together as in the figure and are crossed by another dark line as MN passing through B the centre of the light ring of the plate (P. Fig. 3) appearing at every quarter revolution of the crystal plate 1 K (Fig. 1), on the axis AB; and by actual measurement the coloured rings are found to have the form of lemniscates, whose principal property is that two points of a line drawn from the points P and P’ to any point in each curve is constant.

The general equation of Bernoulli’s lemniscate is 
\[(x^2 + y^2)^2 - a^2(x^2 - y^2) = 0\]
in which \(a\) is equal to half the axis \(m\) of the particular curve.
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 produced the appearance of a dark cross, the point of intersection being in the centre of the field, or where the latter is traversed by the ray AB.

When \( \omega = 0 \), or the axes of polarization in AB and BC are coincident, the expression (c) becomes

\[ \alpha^2 = (1 - \sin^2 \theta) \frac{4 \sin^2 \theta}{R} \]

(c) which when \( \omega = 0, 90^\circ, 180^\circ, \) and \( 270^\circ \) becomes \( \alpha^2 \), a maximum: hence the coloured field of view will be traversed by a white cross, twice as long at right angles to one another.

If \( \alpha \) have other values, the expression (b) or the density of light will vanish when \( R = 0, R = \pm A, R = 2A, \) &c. The equivalent of \( B \) containing, as a multiplier, \( \sin^2 \theta \); (1 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, \( \theta, 2\theta, \) &c., it is found that \( \sin \theta \) has corresponding values propor-
tional to \( R = \frac{2A}{\theta}, \frac{5A}{\theta}, \frac{8A}{\theta}, \) &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 \( \phi \) of incidence in the conical pencil diverging from A are the same, it follows, that about the axis of the field of view, there are bands whose radii have the proportions of \( \sqrt{2}, \sqrt{3}, \sqrt{4}, \) &c. The expression (b) is a maximum

\[ R = \frac{1}{3}, \frac{2}{3}, \frac{3}{3}, \frac{4}{3}, \] and when \( \sin \theta \) has values propor-
tional to \( 1, \sqrt{3}, \frac{3}{\sqrt{2}}, \sqrt{4}, \) &c.; and it follows that,

about the axis of the field, there is a series of bright rings whose radii have the proportions of \( \sqrt{1}, \sqrt{3}, \sqrt{4}, \) &c.

The expressions (b) and (c) added together produce \( \alpha^2 \); hence the tints of the several rings formed when the planes of polarization in AB and AC are coincident are complementary to those which are formed when those planes are perpendicular to one another: for the dark rings have radii which are proportional to \( \sqrt{2}, \sqrt{3}, \sqrt{4}, \) &c., while the dark rings have radii proportional to \( 1, \sqrt{3}, \sqrt{4}, \) &c.

For the investigation of the phenomena of the rings seen (as in Fig. 4) when AB is a bi-axial crystal having its surfaces cut perpendicularly 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 perpen-
dicular 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 Encyclopædia, and to Sir John Herschel’s Treatise on the Study of Artificial Starlight.

POLEMONIUM (polémonion of Dioscorides), a genus of plants, the type of the natural order Polemoniaceae. It has a campanulate 5-cleft calyx, a rotatory corolla, and a short tube with a 5-lobed smooth cap. The seeds are at times 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; a roundish capsule with membranous crustaceous valves, covered with the permanent calyx and many-seeded seeds; 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, bracteate, arranged on panicled corymbus, with blue or white corollas. About twelve species have been described, most of them being cultivated and known in our gardens as Greek Valerian.

P. cordatum, common Greek Valerian, Jacob’s Ladder, or Ladder of Heaven, has a glabrous stem, pinnate leaves, ovate lanceolate acuminate lacinias, the segments of the calyx ovato ovato or elliptic, lanceolate, pointed; the panicule downy, glabular. The flowers on one or two feet high, the two ter-
ners, 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 raised, some of which are of great beauty and useful in our gardens, and will grow in any common garden soil, and may be readily propagated by dividing the root or by seed. Although deriving its generic name from the Polemonium of Dioscorides, the plant so called is not the species described of that plant, and Fras refers it to Hypericum olympicum. Great virtue were attributed to the antient Polemonium, and these were transferred to the modern plant; but neither the antient nor modern plant possesses any active medical properties. Slight astrigency is the only property possessed by any of the species of Polemonium. (Fras, Synopsis Plant. Flor. Class.); Don, Garden’s Dictionary .

POLICE. In the Scottish large towns have separate police statutes, by which the management and control of the system is put into the hands of elected commissioners. The act of 1846, &c. is a general act authorizing the constitution of police districts, or a portion of them, may be adopted, so as to become law, by any royal hurch, hurch of regality, or hurch of bony, at a meeting of a specified number of ten- pound households, or other local associations. The act provides for the election of commissioners with power of management and control, by the same class of persons who are entitled to decide on the adoption of the act. By 2 & 3 Vict. c. 65, called the Rural Police Act, the commissioners of empty or any county are authorised, at a meeting called on requisition by ten of their number, to assess the county for maintaining a const-
estation force. The act directs the commissioners to publish annual accounts of receipt and expenditure. The system is co-operative with the expenditure of an old established fund for rural police purposes, called the ‘Rogue Money.’

POLLAJUOLI, PIETRO ANTONIO, was distinguished Florentine artist and sculptor of the fifteenth century; they were the sons of Jacopo del Pollajulo. Piero was the pupil of Andrea del Castagno; Antonio was the more distinguished of the two. He was summoned to Rome, and assisted him in the celebrated gates of the baptistery of San Giovanni; he became also a famous goldsmith, and was as such without a superior in Florence. Mase Finiguerra was his contemporary, and was greatly assisted by him in his paintings together; the best of them, says Vasari, is the Martyrdom of St. Sebastian, painted in 1475, in the church de' Servi at Florence. St. Sebastian was painted from nature and is one of the best figures that had been painted up to that time; it is engraved in the Etruria Pittrice of Lastrini. Anto

nio is said to have been the first artist who studied the dead subject for the design. Antonio Pollajulo was invited to Rome in 1484, after the death of Sixtus IV., by Innocent VIII., and he made the monuments of Sixtus IV., and of Innocent VIII.; that of Sixtus, in 1493, is now in the chapel of the Sacrament in St. Peter’s; the monument of Innocent is also in St. Peter’s. Antonio was also a medallist, and he engraved three or four plates, which are extremely scarce.

(Vasari, Vite de’ Pottori, &c., and the notes to Schorn’s German translation; Rumohr, Italianische Forschungen; Cicogna, Storia della Scultura; Baldinucci, Notizie dei Professori del Disegno, &c.)

POLLAJUOLO, SIMONE DEL, or Simon Masi, a distinguished artist and sculptor, celebrated for his ability in relating stories, was born at Florence in 1454. He was related to Antonio del Pollajulo, and lived with him some time at Rome. He is chiefly distinguished for the Palazzo Strozzi, one of the noblest works of art of Florence; it was commenced in 1489 by Benedetto da Maiano, but was completed by Cronsacca, and the great corsoic or estalliture and the court in the interior are from the designs of Cronaca. The ironwork and the beautiful lan-
terns 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 deliv-
ered his work; Caparra was a money receiver or deposito of his own money.

Grosso was the most celebrated smith of his time.

Cronsacca 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 convent Dei Servi, and the Sacrity of Santo Spirito. He was a fol-
lower of Savonarola; he died in 1569.

(Vasari, Vite de’ Pottori, &c.; Gage, Carteggio Inedito d’Arte. &c.)

POLLOK, ROBERT, a poet and miscellaneous writer, was born at Muirhouse, in the parish of Eglashan, in Ren-
freshire, in 1789. He studied at the university of Glasgow, and afterwards entered the course of natural philosophy necessary to fit 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 of his abode, and describes the simplicities of the scenes in which he passed his youth.
He was a hard student, and appears to have been early en-
dowed with a strong ambition to create for himself a per-
manent name in literature. In his own words—

"The voice be heard, read, thought worth, and
With old heads of honorable name.
Measured his soul severely; and looked
To fame, ambitions of no second place.

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 attached to a small body of dissenters, was not likely
to produce any impression on publishing circles. It was
nevertheless 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 dry-
ness and insipidity, while it was warmly admired by the
literary world at the time. Mr. Pollok is a poet of simple
imagination, for his plan is 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 highly regarded by religious and too
insipidly 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
sentiments are spun out or repeated, and the interest frequently
flagging. 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 follows Milton often too closely in his diction. Before the
publication of his poem this interesting young man
had undertaken 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
December, 1897.

POLYCARPON (from σωλή, many, and ἀσπασσός, a seed or
fruit: seeds numerous), a genus of plants belonging to the
natural order Polygonaceae. The sepals of the corolla, attach-
ing at the base, the petals 5 and emarginate. The stamens
from 3 to 5; styles short and 3 in number. The fruit is 1-
celled, 3-valved, and many-seeded capsule.

P. peltatus has numerous bright crimson petals, lanceolate
leaves in fours, and the leaves on the branches
opposite. In young plants the leaves are often all opposite.
It is a native of the coasts of the south-west of England,
of Ireland and the Canaries.

There are two other species of Polygonon: P. dinic-
ides, an inhabitant of Europe, the Cape of Good Hope, and
Holland; and P. pepliods, a native of Styria 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.

P. peltatus (from σωλή, many, and ἀσπασσός, a seed or
fruit: seeds numerous), a genus of plants belonging to the
natural order Polygonaceae. It has a 5-petalled corolla, from 3 to 5
stamens, and from 2 to 3 styles; a 1-seeded trigonous or compressed nut,
inside curved embryo, the cotyledons not contorted. This
is a very extensive genus, containing the knotgrasses, bistortas,
pea-sedges, great duckweeds of our own waysides, fields, and
gardens. They grow in almost any soil, some being aquatic,
and others flourishing in sandy sterile tracts

P. bistorta, Snake-weed, has a dense spike, ovate subcordate
leaves, the radical leaves with winged foot-stalks, the sta-
mous half as long again as the perianth, the nut tritqueotous,
its faces ovate, smooth. The calyx is rose-coloured and
deply five-lobed, obtuse, and spreading. The fruit is black
and shining. This plant is one of the most showy
of our table herbs, its root contains tannin and gallic acid in
abundance; a decoction of it is employed in gleet and
leucorrhoea as an injection, as a gargle in sore-throats, and as a
lotion for the eyes. It is distributed with exceptional abundance.
It has been used combined with gentian in intermitents.
It may also be employed in passive hemorrhages and diarrhcea.

P. sativum has a dense ovate cylindrical spike, stalked
ovate or heart-shaped leaves, a compressed nut, 6 stamens, and a
creeping root. The flowers are of a bright
red colour. It is a native of England in ponds, ditches, and
ponds. It is a fine showy plant, but one of the most
diuretic, and it is distributed from land to
or drained lakes and marshes. The subaquatic stems at
every joint, and extend to a surprising length, rising through
the soil, and bearing some resemblance to sarsaparilla, and
according to Cotta and Willmet they are substituted for this
by the herborists of Nancy; these authors also report
that the apothecaries and druggists of Lorraine give it the
preference.

P. hydropiper, the Water-Pepper, has drooping filiform
interrupted spikes, lanceolate wavy leaves, glandular perianths,
a large compressed nut, its faces ovate, acute, and of a
purplish crimson colour. The black color is a hot acrid plant, and is reputed to be a
powerful diuretic, but it loses its activity by drying,
and therefore requires to be used in a fresh state. It dyes wool
of a yellow colour. The seeds, according to Bulliard, are used
in some of the French medicines instead of pepper. The
leaves are so acrid as to act as aperient. It is native of
England in ditches and wet places.

P. anisoides has from one to three flowers together, axillary
lanceolate leaves, or elliptical plane stalked lanceolate acute
seeds, with few simple simple nerves at length by growth
becoming tor, a tritqueotous nut with raised points shorter
than the perianth. Its numerous seeds supply abundant food for small
birds; they are said to be excellent aphatic. Thomson says
that in Japan a blue dye is prepared from this plant.
There are many other species of Polygonon, natives of Great Britain
and other parts of the world, but too numerous for description here.

P. tincturis is cultivated in France and Flanders on account of
the fine blue dye extracted from it. The seeds of P.
barbatum are used in medicine by the Hindu practitioners,
and are said to ease the pain of piping in the colic. The
leaves of P. hispidum are said by Humboldt to be substituted
in South America for tobacco; and P. anti-haemorrhoidale is esteemed in Brazil on account of its astringency in baths,
poultices, &c. &c. The juice, as well an infusion of the ashes
when burnt, is employed by the Berio in the clarifica-
tion of syrup and the condensation of sugar.

P. Fagopyrum, the Buck-wheat, is now referred to Fagopy-
rum esculentum. [FAGOPYRUM, C. B. S.]

(Linn.) is a scented annual growing in Flanders.'s Manual Brit.
Bot.; Burnett's Outline of Botany; Lindley's Florida Medica.)

POLYPODIUM. [FILICES, P. C. S.]

POLYPODIOGN (from σωλή, many, and ἔπειτος, a beard), a genus
of grains belonging to the tribe Agrostidæ. It has serrous
equal grains, each furnished with a long seta from
just below the emarginate summit. The pappus are shorter
than the grains, the outer ones usually curved from below
the summit.

P. moniales has the setae more than twice as long as
the rather obtuse grains. It has a fl Learning root, a stem
from a foot to foot and a half high, the leaves lobed silky panicle
often two inches long. The grains are linear and hairy. It is a very beautiful grass, and is a native of Great Britain
in salt marshes. It is the Deserbius (fox-tail) of Theophras
tus, Hist. Plant. 7, 17.

P. littoralis has its setae equaling the acute grains.
The root is somewhat creeping, the stem a foot high, the
panicle close lobed and purplish. The grains are linear
and lanceolate. It is a British species and is found in
muddy salt marshes.

(From BAILEY'S Manual of British Botany.)

POLYTECHNIC SCHOOL. This Institution, which
has been established in the ion of pure and physical science, originated, at the time of
the great revolution in France, with one of the representatives
of the people, named Prieur (le Cote d'Or), who being a
member of the Committee of Public Safety, and charged with

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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 the committee, addressed to the Directory, under the designation of "École centrale des Travaux publics," was, by a decree of the Convention, dated 21 Ventôse, An II. (Feb. 18, 1794), directed to be formed; and the charge of organizing it was wholly committed to Fourcroy, who carried on a correspondence with the Comte de Moivre: 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 remaining three years at the institution, during which time they were to be instructed in the higher branches of mathematical 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 [Moxor, P.C.], with applications to statics, anatomy, and fortification; the second branch consisted of chemistry and natural philosophy. A building in the Rue St. Geneviève was chosen, and the school was divided into classes, each consisting of persons who carried on their studies in a separate hall, during the 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 physical or chemical experiments.

They 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 method followed in the school formerly existing at Mézières, for military engineers; and in the school of chemistry and mining at Schénmitz in Hungary.

Such was the origin of an institution with respect both to the talents of its professors and to the contributions which science has received from so many of its écoles, 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 injurious 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 Baltars, on fortification by Dobenheim, on chemistry by Neveu, by Fourcroy, and on analysis by Freny.

In the course of the same year, 1796, the National Convention decreed that the "École centrale des Travaux publics" should be called the "École Polytechnique," and that the 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 first degrees, their 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 present, and the examinations were to be conducted by daily committees of professors, who had served 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 serjeants of artillery, and their daily pay was 98 centimes (99 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 name of École centrale des Travaux publics, and it received an organization completely military. While that extraordinary man governed France the institution may be said to have been in its most flourishing state; and the subjects of the course of study were then arranged under the heads, as follow:—Mathematical analysis; mathematical analysis applied to geometry; descriptive geometry; mechanics; machinery; natural philosophy; chemistry; geodesy; geology; by Monge on perspective, topography; the theory of figures and landscapes; grammar and the belles-lettres. At that time also, the following were the subjects a knowledge of which was required for admission to the school:—1. Arithmetic, with an exercise containing the resolution of equations of the two first degrees—indeterminate equations of the first degree; the compi-
tion of equations—demonstration of the binomial theorem—the method of commensurable divisors, and that of equal roots—the resolution of numerical equations by approximations, the elimination of unknown quantities in equations of any degree having two unknown quantities. 3. The theory of proportion—progressions and logarithms. 4. Elementary geometry and plane trigonometry. 5. Part of the conic sections. 6. Distribution of foci and conics, presented by equations of the first and second degrees with two unknown quantities—the principal properties of conic sections. 7. Statics demonstrated synthetically and applied to the treatment of the machinery, the anchor, the balance, the lever, and the axio, etc. The candidates were also required to translate part of a Latin author in prose and give a grammatical analysis of French passages. 9. To come to the compasses and a geometrical figure which the examiner might indicate. 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, demanded to put themselves in opposition to the 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 the examiner at the examinations. These acts were of violente that the king, Louis-Philippe, entirely suppressed the institution. It has, however, again been revived, and, except a few of the most culpable, the same students have been readmitted.

The object of the Polytechnic School is still the same as its formation; and the young men are educated for the following branches of the public service: viz., the artillery of the line; gendarmerie, military and le genie maritime; the marine royal and the corps des ingénieurs hydrographes; the ponts et chaussées and the mines; the corps royal de d'etat-major; the poudres et salpêtres, and the administration of the tabacs.

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 (411. 13s. 4d.), and the expense of his clothing is, in addition, about half that sum. The commander-in-chief of the French army 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 naturalized subject of the kingdom, and he must be between the age of twenty and thirty years of age; he, 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 regiment.

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, according to the degree of merit which is 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 Ministre 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 entitled 'places gratuities,' and each is equivalent to two thousand 'planches demi-gratuites' which the minister may grant to persons who are capable of paying half the amount of the subscription. The programme of the subjects, a knowledge of which is required preparatory to admission, is very nearly the same as that which has been given above. The students rise at 5 A.M., and breakfast at 7 A.M.; their hours of study and recreation for each day are regulated, and they dine at 2 P.M. To be sun at 8, and at 9 P.M. The lights are extinguished at 11. The 'Jour de l'Ecole Royale Polytechnique' continues to be published by the 'Conseil d'Instruction,' and it contains many valuable essays on subjects relating to the highest branches of scientific learning, and a special section contributed by La Grange, Monge, Le Place, Poisson, Prony, and other celebrated men; and those of more recent date are written by the ablest mathematicians of France, several of whom have been pupils of the institution.

**PO'MELE.** A species or sub-order of the natural order of Rosaceae. [Rosaee, P. C.] The following is a synopsis of the genera belonging to this section of plants:

1. *Cydonia* (Cydonia oblonga, 5-cleft; petals orbicular; ovary 2-5-celled; styles 2-5, glabrous; the fruit fleshy, ovate, containing a bony pome. [Cy-

2. *Cydonia reticulata* (from *maje*, a needle, and *Aeric*, a scale). The limb of the calyx funel-shaped, deciduous; the ovary 2-celled, 2-styled; the fruit with a thickened closed disk, and a papery pustule containing 5 gibbous seeds. [Cya-

3. *Crataegus* (gier, ground, and *maje*, an apple). Calyx truncate, with 5 little teeth; the petals small, cross; the stamens 10-15; the ovary 1-celled; the style long; ovaries 2, erect.

4. *Pyrus* (from *pyrus*, shining). Calyx 5-cleft; petals reflexed; ovary villous, 2-celled; styles 2, glabrous; fruit 2-celled inclosed in the fleshy calyx.

5. *Eriobotrya* (from *Eri*, wool, and *botrya*, grape). Calyx woolly, 5-toothed; petals bearded; styles 5, plisse, inclosed; fruit closed, 5-3-celled.

6. *Cotoneaster*. Flowers polygamous; calyx turbinate, bluntly 5-cleft; petals short; stamens of nearly equal length of the calyx- cine teeth; styles glabrous, shorter than the stamens; 2-3 carpels, pterial, inclosed in the calyx with 2 ovules. [Cot-

7. *Sorbus*. Calyx 5-cleft; petals lanceolate; stamens shorter than the calyx; ovary of 10 cells or 5 bipartite ones with a solitary ovule in each partition; styles 5, joined at the base; fruit 3-5-celled; seeds 3-5; the endocarp car-tilaginous, semi-transparent.

8. *Malus*. 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 bearded, and like the petals.

9. *Osculeia* (from *serio*, a bone, and *maje*, an apple). Calyx 5-cleft; petals oblong; styles exerted, the same length as the stamens, bearded below; ovary 5-celled; cells 1-seeded; fruit round, woolly, and red, inclosed.

10. *Pyrus*. Calyx urceolate, 5-lobe; petals roundish; styles usually 5, rarely 2 or 3; fruit closed, 5-celled; cells cartilaginous; seeds 2 in each cell. [Pyrus, P. C.]

11. *Alum.* Calyx 5-cleft; petals orbicular; styles 5; fruit closed, 5-celled; cells cartilaginous, many-seeded; seeds covered with pulp.

The species of the genus Raphilepria are known by the name of Indian Hawthorns. 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 Crataegus or Measopus. These are—

1. *R. indica*. Tree of Military Order. It is a native of China; *R. indica*, a native of Cochin-China; and *R. salicifolia*, a native of China. All the species are trees in their native climates, with evergreen crenated coriaceous leaves, and flowers in terminal corymbose panicles, followed by small fruit. They require the same treatment as the species of Crataegus, and are eminently ornamental.

2. *P. serrulata* and oblong acutum serrulata, 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. Where there is too cold a grow it is standard, it may be placed against a wall. *'Fit associates for it against a wall are Pho-

3. *Eriobotrya japonica*. (London.) That species is the only one that could be called a standard, it has been cultivated in this country. There are four or five other species described, natives of Asia, which might probably become with success.

4. *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 silky compound terminal racemes of flowers, and subulate deciduous bracts. *E. japonica* is the common Loquat. It has broad elliptic serrate rather wrinkled leaves, tapering at the base and acuminate at the apex, and the fruit is greenish yellow, globular, with a single seed, enclosed in a fleshy scarlet aril, and surrounded by three leaf-like persistent bases that usually remain on the tree. The plant is a small tree attaining a height of from 10 to 20 feet, and is a native of China and Japan. The fruit is of a mellow size, pear-shaped, yellow, downy, and disposed in large pendulous branched clusters. The seeds are indehiscent, and are set on a thin stalk. 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* described, but none have been introduced into cultivation in this country.

**Amelanchier** is another genus separated by Lindley from the old genus *Mirabilis*. 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 attains in autumn. *A. vulgaris*, the common Amelanchier, has roundish-oval glabrous leaves, downy beneath, glabrous afterwards; the flowers are white, and appear in May; they are found in rocks in many parts of the continent of Europe. It has been in cultivation in England since the year 1596. *A. betulaefolia*, the Grime-Pear, has oblong-elliptical crowned with a brown down. It has a smooth brown bark, and is a little fragrant when wounded.

The *Pyrus amygdaliformis* of Sir J. E. Smith has been made into the genus *Osbeckia* 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 style and calyx.

The species of *Cydonia* yield the fruit called the Quince. *Cydonia vulgaris*, or *Quince*, P.C. F. C. S. No. 141

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POOR LAWS, SCOTLAND. The foundation of the Old Poor Law of Scotland was the act of parliament, 1579, c. 74, which in reality did away with a poor law. It was so called because it was by the 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 act, a settlement was acquired by birth, and once so established could not be changed unless by a seven years' industrial residence in another parish. By the act of 1672, 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 through the law-givers' mistaken idea that he was a party by the judgements of the court 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 'tithers,' or rated land proprietors; but it became customary for the latter to interest themselves solely in the voting and levying of the rate, leaving its distribution and the management of the poor to the former. In those munici in the towns, the duty of 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 deconchyances being assessed on the properties of the inhabitants. The rates assessed 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
POO 442 POR

four.

the poor, the hewers and scuffle in a country parish, or the magistrates in a town parish, might lose immediately the peonage of the poorer classes, as is provided for the administration of the poor law.

Firstly, the public were kept in ignorance, and the real practice came to be that, if the miscellaneous sources were insufficient for the relief of the poor, the hewers and scutters in a country parish, or the magistrates in a town parish, might lose immediately the poonage of the poorer classes, as is provided for the administration of the poor law.

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Those legally entitled to relief; the other became a fund for general charitable purposes at the command of the kirk sessions. This was so advantageous, and the regular practice came to be, that if the miscellaneous sources were insufficient for the relief of the poor, the hewers and scutters in a country parish, or the magistrates in a town parish, might lose immediately the poonage of the poorer classes, as is provided for the administration of the poor law.

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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 from being fluid by being pressed into the pores of paper, and in the Florence experiment, for determining whether or not water is compressible, the fluid was by pressure forced through the pores of the paper, and dried in the air. The porosity of bodies is inferred from their elasticity and the sounds which are heard when the molecules are in a state of vibration: also, in transparent bodies the least dense may be more easily shocked into a state of oscillation, and made to vibrate than the denser, for it is inferred from the fact that the particles of light pass through them, or that the vibrations of an external fluid take place among the molecules. It may, therefore, be said that the porosity of bodies is inferred from the fact that they are open to a certain degree of volume by being exposed to cold, and by mechanical compression, since such contractions can only take place in consequence of the particles being forced closer together than they are in the unpressed states of the bodies.

When salt is dissolved in water, the particles of the former seem to introduce themselves between those of the latter, so that the volume of the mixture is less than the sum of the volumes of the separate substances; and the like may be said of the mixture of alcohol with water; in which cases the particles of one of the kinds of substance appear to enter and occupy those of the other which are less capable of being filled up by the space that is left unoccupied. The mutual distances of the particles of gaseous substances are very great; and though, in some cases, the volume of a mixture is equal to the sum of the volumes of the separate gases, yet, in others, it is less than this. The inaccuracy in this case seems to be from the fact that they suffer contractions of volume by being exposed to cold, and by mechanical compression, since such contractions can only take place in consequence of the particles being forced closer together than they are in the unpressed states of the bodies.

All material substances subject to attractive forces, it has been made a question whether the attractions which take place between the molecules of bodies, and which are insensible at all appreciable distances from them, are the same as that general attraction by which bodies are attracted through space; modified, however, by the figures and mutual distances of the molecules, by heat, electricity, and perhaps by powers which are at present unknown to us: but, in order that this hypothesis may be admissible, the dimensions of the molecules of bodies should be extremely small compared with those of the spaces among them; and the densities of the molecules immensely greater than the densities of the bodies themselves. *La Place* estimates ("Système du Monde," ch. xviii. 4th ed.) that a molecule of a spherical form, whose diameter is one millionth part of a metre, ought to have a density more than six million times as great as the mean density of a body of the same size. Their attraction is equal to that of terrestrial gravity; and he observes, that the attractive forces exercised by the molecules of bodies, which are probably only the excesses of the entire attractions of the atoms of which the molecules are composed, must be vastly greater than that of gravity, since the actions of the molecules of a body produce visible effects of the rays of light, which cannot be ascertained concretely by the eye.

**PORTER, SIR ROBERT KER, K.C.H.,** was born at Durham in 1780, but his early boyhood was passed in Edinburgh, whither his mother removed upon the death of her husband, who was an officer in the English army. He was the brother of Anna Maria Porter and Jane Porter. His strong natural disposition for the arts was first called into activity by the celebrated Flora Macdonald. Sir Robert, then a boy of only ten or twenty years of age, was spending the evening with his family in the house of that extraordinary lady, who, perceiving his fixed attention to a certain battle-piece, explained to him that it was one of the battles of 40; and she proceeded to describe the battle in all its details in such glowing terms that the boy's blood kindled, and from that moment he became a painter of battles. From this time he was incessantly sketching battles, and his mother 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 West, the president of the Royal Academy, who is said to have been so pleased with the boy's skilful drawing, that he procured his admission into the academy, and predicted his certain success with confidence. Sir Robert's careful portraiture reminds that of a well-known artist so much as to be easily mistaken for one. In 1793 he had already evinced such extraordinary progress as to receive a commission to paint an altar-piece for Shrorditch church. In 1794 he presented an altar-piece of Christ allaying the Storm to the Roman Catholic chapel at Portsea; and in 1798, another of a storming in the Wilderness, to St. John's College, Cambridge. His most extraordinary productions, however, were his great battles. In the year 1800 he exhibited an immense picture of the Battle of Trafalgar, 20 feet long, in the Great Room at the Royal Academy, presenting the storming of Seringapatam. He is said to have been only six weeks in painting the picture, and yet the execution was in no part neglected. West, after he had seen it, went to some of the academicians to inquire of their impressions, and said, he had just looked what he must consider a wonder in the art: a work of such dimensions, finished throughout, in a brevity of time which any other man would demand even to prepare the ground on which it is painted. 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 the Battle of Alexandria, 1802, to 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 painted also pictures of the Battle of Albufera in 1805, and the Battle of the Cape of Good Hope in 1806. In 1804 he went to Russia, and was appointed historical painter to the emperor. While he was in St. Petersburg he gained the affections of the Princess Mary, the daughter of the Prince Theodore de Sherbatoff, of Russia, and the marriage 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 the walls of the walls of the Admiralty, the planning the port of Cronstadt and St. Petersburg. After his return to England, about 1806, he published 'Travelling Sketches in Russia and Sweden.' In 1808 he accompanied Sir John Moore's expedition to the Peninsula, and attended the campaign throughout, up to the closing catastrophe of the battle of Corunna. On his return to England he published some anonymous letters from Spain and Portugal.

After his return from a second visit to Russia, after his marriage, he published, in 1813, 'An Account of the Russian Campaign,' and he was knighted by the Prince Regent in the same year. He executed many sketches of the campaign in Portugal, and in 1817-18-19-20 was in France, 1817 to 1820, occupied in 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." He wrote also "Costumes, Antiquities, &c.," 2 vols. 4to. In this work are many excellent designs in outline from the fine characteristic ancient sculptures of Nakshi Rostam, Nakshi Rajah, Shiraz, and Persepolis. The artist's attention is called to the representations of the basi-litiavi of the steps at Persepolis will show how extremely inaccurate and insufficient are the previous engravings given by Le Brun, Niebuhr, and Chardin. 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 without the least skill whatever; the representations of Sir John Chardin are not much better.

In 1823 Sir Robert Ker Porter was created Knight Commander of the order of Hanover, by William IV.; he was appointed a few years before British consul at Madrid, where he resided at Caracas until 1841, and he painted while there three sacred pictures, which were his last principal works; he also made numerous sketches of scenery in the meanwhile. The first of these three pictures was Christ at the last Supper blessing the Cup, painted as an altar-piece for the chapel of the Protestant burying-ground, of which he had procured the establishment; but he removed it afterwards on account of the representations of the scenes of the Ten Commandments in the native language. The second was our Saviour blessing the Little Child; and the third and last was an Ecce Homo, of which he presented as portraits of General Bolivar. In 1841 he sold his last visit to St. Petersburg, and the cold winter appears to have been too...
match a his is he a concave bractlets the the a sometimes now 4-flowered. 3rd from tish swans, by tions to the tish which on opening the 25 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 apoplexy which was caused by his having taken a little 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.

(Athenæum, 1842-48, and the Artist's Works.)

PORTFIRE is a composition consisting of saltpetre, sulphur, and mixed gunpowder, mixed together by being rubbed between the hands, and, after being passed through hair-skeins, 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 inches long will burn from twelve to fifteen minutes.

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; but it is frequently employed for the purpose of lighting rapid-firing guns, when the equations of the like ingredients are 7, 2, and 8, respectively. For these last purposes the portfire is attached at the extremity of the train, or is inserted in the shaft bored in the rock or object to be blasted; and the fire thus applied to it by a match.

POTIDONOMYA [Poston, P. C.]
POSSESSION FRATIS. [Dacret, P. C.]
POST HORSES. [Postig, P. C.]
POTAMOGETON (from ἄποκτας, a river, and the termination ὑγων, which probably means 'produced'), a genus of plants belonging to the Endogenous class, and the natural order Potamaceae. It has a perfect flower, a 4-carpellate perianth, 4 sepaline anthems 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 peddles plano-concave above, the nuts large, rounded on the back when fresh keeled; when dry the peddles are equal. There is a creeping rhiza 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, peddiluc oblong linear leaves, sessile and wavy, the nuts with long beaks, keeled on the lower and then dry the peddiles are equal. It is a native of Great Britain.

P. denus has its leaves all opposite, peddiluc, clasping, elliptical-lanceolate or lanceolate; the spikes shortly stalked, ultimately reduced; the spike is 4-flowered. For it is famed in 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 Potamogoton, and Haller says that in the Swiss lakes P. serratum grows to the length of from 10 to 20 fathoms, forming extensive subaqueous forests. (Burnet's Outlines of Botany; Barbington's Manual of British Botany.)

POTAIOMYIA, a genus of Conchifera from the fresh-water strait of Beacon Hill, in the Isle of Wight. (Sowerby.)

POTATAVILLA (potatis, powerful, from the supposed medical qualities of some of the species), a genus of plants belonging to the natural order Rosaceae. It has a conceve calyx from 4 to 5-parted, with 4 or 5 bractelets; there are from 4 to 5 petals in the perianth, 5 stamens, a larger, round, or nearly terminal style. The fruit consists of numerous small nuts placed on a flattish dry receptacle; the seeds pendulous or ascending, the radicle superior, the flowers white or yellow, rarely red. It is divided into the following species:—it is found likewise in other parts of Europe. The stem is filiform, procumbent, and creeping; the leaves quinate and stalked; the leaflets obovate, serrated; the peddiles solitary; carpelline above 4, ovum; the fruit sessile; style short; the seeds very small.

POTATOMON + PLANTS. When plants are placed to grow in a small earthen vessel, like a garden-pot, their condition is very different from that to which they are naturally exposed. The roots have not liberty to extend themselves as they choose; nor can they go out of themselves or round the vessel in which they are confined; they are likewise exposed to great varieties of temperature and depend on an uncertain supply of moisture. It is therefore the business of all who undertake these experiments to secure the advance of their plants.
tages 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 increases 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. Exhaustion 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 pans-feeders, shallow earthen vessels containing a drainage, to which the roots are admitted 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 skilfully 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 planting greenhouse plants into the earth during the summer to obviate this is very undesirable, 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 counteracting the injurious effects of unequal temperatures is by the use of double pots, as recommended in "The Gardener's Magazine," iv. 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 earthenware should be placed at the bottom of the pot 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 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 a thorough knowledge of the kind of atmosphere which suits them best, that have been obtained those magnificent pelargoniums, cockscombs, and balansa, &c. that have so often and so justly excited the admiration of even the most experienced gardeners.' (Lindley's, "Theory of Horticulture.")

POUNDAGE. [Summit, P. C.]

POWER. We find that the article Power, P. C., does not answer the reference made from Powers, 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 fact, the manner in which the term power was introduced into arithmetic is seen. By definition, the fourth power of a, the product of the four a's, or \(a \times a \times a \times a\); and the same of other powers. But it is far more symmetrical to begin from unity; and to say that the fourth power of a is the result of four multiplications by a, unity being understood as the commencement. Thus the successive powers of \(x, x^2, x^3, \text{etc.} \) are \(1 \times x, 1 \times x \times x, 1 \times x \times x \times x, \text{etc.}\) denoted by \(x, x^2, x^3, \text{etc.}\). 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 peculiar algebraical character of the root is explained in Powers, P. C.

It is thus easily proved that when a and \(n\) are any two integers, \(a^m = n\); when \(m\) is greater than \(n\), \(a^m = a^n \times a^{m-n} \times a^{m-n} \times \cdots \times a^{m-n} \times a^n\). Also that, \(x^{m} \times x^{n} = x^{m+n}\), and that \(1/x^n = x^{-n}\), whenever \(m\) is divisible by \(n\) without remainder. These rules, if applied in defiance of the restrictions first mentioned, lead to such results 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 \(m\) may be; secondly, \(x^n\) must be understood to be \(1 \times x^n\); thirdly, \(x, m\) and \(n\) being positive integers, must stand for \(x^n\). When these new definitions are added, all the rules remain true, whether \(m\) and \(n\) 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 \(a^2 + bx^3 - a^4 \times x^4\) is not at present arranged at all. To arrange in ascending or descending powers of \(x\), we must write it thus—

\[ bx - x + a^4 - a^2 - 1 \]

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

\[ bx^2 - a^4 - a^2 - a^3 - 1 \]

Written in this form, which may remind us of the use of a cipher in writing ordinary numbers, it is clear that we hardly need the expression less casually, 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—

\[ bx^2 + a - 1 + a + 4 - 1 \]

Written in this form, which is analogous to the decimal notation of the positive and negative powers. Thus the above might be written—

\[ bx^2 - a^4 - a^2 - a^3 - 1 \]

Accordingly the answer is \(x^2 + 2x + 1\); and every stroke of the pen which the usual method contains, more than is in the preceding, is mere waste, and risk of error is bargained. Instead, let it be proposed to divide \(x^2 + 2x + 1\) into \(a^2 - 2a + 1\), or \(a + 1\). Now let us propose to divide \(x^2 + 2x + 1\) into \(a^2 - 2a + 1\), or \(a + 1\). The late Mr. Horner [Isleworth, etc., 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 to require to multiply \(2x^2 - 2x - 3\) and \(2x + 4\);—

\[ 2x + 4 + 1 - 5 \]

Accordingly the quotient is \(4x^2 - 11x + 27\) and the remainder is 772 + 33x - 45x^2. Mr. Horner himself did not live to publish this suggestion, which, simple as it is, seems never have been made before him. This paper is contained in "The Ladies' Diary" for 1839; having previously introduced the simplification into the 11th edition of Hutton's Course. Since that time a paper on "Algebraical Transformation," sent by Mr. Horner to the Royal Society, but not printed in the "Philosophical Transactions," has been pub-
POW

POZ

listed in the first and second volume of the *Mathematician*. Details and examples are given in Mr. Davies' *Solutions of Questions contained in Hutton's Course*, 1840, and in the 12th edition of that course, 1841.

But the greatest improvement in the operation of division, and one which contains the principle of a class of improvements, is one which Horner called the *synthetic method*, which amounts to deferring the actual steps of subtraction until they are wanted. If we were to proceed one step farther with the preceding division, -44 in the quotient would be followed by +77. This +77, if we look at all its components from the beginning, arises from +0 -11 +0 +68. In like manner -44 arises from +4 +4 +4 -0. Now arrange the process as follows:

\[
\begin{align*}
14 & + 3 & + 2 & + 0 & + 0 & -11 & -1 \\
-2 & + 8 & + 0 & + 4 & + 11 & + 24 & + 44 \\
+0 & + 22 & + 1 & + 0 & + 0 & + 0 & -4 \\
+1 & -4 & -4 & -8 & -8
\end{align*}
\]

4 -11 +24 -64 +77 +13 -45

Write the coefficients of the dividend horizontally, \(a, b, c, \ldots\), and of the divisor vertically \(p, q, r, \ldots\), taking care to change the sign of every term of the divisor except the first.

\[
\begin{align*}
\frac{a}{p} & + \frac{b}{q} & + \frac{c}{r} & + \ldots \\
\frac{q}{w} & + \frac{r}{v} & + \frac{s}{u} & + \ldots \\
\frac{t}{y} & + \frac{u}{x} & + \frac{v}{w} & + \ldots \\
\frac{w}{z} & + \frac{x}{u} & + \frac{y}{v} & + \ldots \\
\frac{z}{y} & + \frac{y}{x} & + \frac{x}{u} & + \ldots
\end{align*}
\]

Divide \(a\) by \(p\), giving \(w\), and then write \(w, v, u, \ldots\) and \(f\) in the successive columns which follow that of \(u\). Make up \(b+p-wq,\) the second column, and divide by \(q\), giving \(v\); write \(w, v, \ldots\) in the successive columns which follow that of \(v\). Make up \(c+q-vr\) and divide by \(r\), giving \(w\); write \(v, w, \ldots\) in the columns which follow that of \(w\), and so on.

Then \(w+v+r+\ldots,\) will give the coefficients of the quotient, and \(u+v+r+\ldots,\) made from the columns which have not been used to find quotient terms, will give the coefficients of the remainder. For example, we want to find some terms of the quotient of \(x^3 + 1\) divided by \(x^2 - 3x - 2:

\[
\begin{align*}
\frac{1}{1} & + 0 & + 0 & + 1 \\
-1 & -1 & + 0 & + 0 & + 0 \\
+0 & + 3 & + 1 & + 2 & + 0 \\
+0 & + 1 & + 0 & -20 & + 0 \\
1 & + 4 & + 7 & + 20 & + 41 & + 60 & + 9
\end{align*}
\]

Hence the quotient is \(x^2 + 4x + 11\), remainder \(-41 + 40x + 2x^2 = 40x^2 + 4x - 41\).

When the first coefficient is anything but unity, fractions are introduced into the quotient. To avoid this, proceed as follows: Let \(a\) be the coefficient of the first term of the divisor, multiply the successive coefficients of the dividend by \(1, a, a^2, \ldots\), turn the first coefficient of the divisor into 1, and multiply the second, third, fourth, \(\ldots\), by \(1, a, a^2, \ldots\). Proceed as above with the coefficients thus altered, and suppose that in the last line the quotient terms become \(u+v+r+\ldots,\) and those \(w, v, \ldots\) for the remainder \(u+v+r+\ldots\).

To find the true quotient terms write

\[
\begin{align*}
\frac{a}{w} & + \frac{a}{v} & + \frac{a}{r} & + \ldots \\
\frac{w}{z} & + \frac{v}{x} & + \frac{r}{u} & + \ldots
\end{align*}
\]

and for the true remainder terms write

\[
\begin{align*}
\frac{w}{z} & + \frac{w}{x} & + \frac{w}{u} & + \ldots \\
\frac{w}{z} & + \frac{w}{x} & + \frac{w}{u} & + \ldots
\end{align*}
\]

where \(am\) is the last power used in the quotient terms, *repeated*, not the next on to it. Suppose for example, we are to divide \(x^4 + 2x^3 + 3x^2 + 5x + 6\) by \(x^2 + 3x - 2\). Here, since \(x^4\) descends and \(m\) seconds regularly, we throw out \(x\) and \(m\), and the abridged dividend and divisor become

\[
\begin{align*}
1 & + 1 & + 1 & + 2 & + 4 & + 4 \\
2 & + 4 & + 8 & + 1 & + 0 & + 0 \\
3 & + 0 & + 4 & + 1 & + 0 & + 0 \\
3 & + 0 & + 0 & + 4 & + 2 & + 0 \\
+3 & + 4 & + 0 & + 0 & + 0 & + 0
\end{align*}
\]

Hence the quotient is

\[
\begin{align*}
1 & + 1 & + 2 & + 36 & + 20 & + 24 & + 48 & + 864
\end{align*}
\]

and the remainder is

\[
\begin{align*}
20 & m^2 & + 24 m^2 & + 48 m^2 & + 864 m^2 & + 16 m^2 & + 32 m^2 & + 4 m^2 & + 182 m^2
\end{align*}
\]

One of the easiest modifications of this rule is the division of \(ax^m + bx^n + \ldots\), by \(x - p\) or \(x - p,\) as explained in *Fractions, Decomposition of, P. C. S.*

**POZZO DI BORGO** (sometimes BARGO), CARLO ANDREOLI, a distinguished diplomatist, was one of that considerable number of remarkable men produced by the island of Corse in the earlier part and middle of the last century. His family 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 education in his own country, Pozzo di Borgo went to finish his studies at Pisa; whence he had not long returned when Corse, 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 there attached himself to General Paoli; and, under the patronage of that venerable head of the patriots, he was appointed, along with General Gentilii, to proceed to Paris with the thanks of Corse 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 sittings in October, 1791. While in Paris, staying in this position, he was able 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 Corse, 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 England. When the new constitution was established, in the summer of 1794, Pozzo, who had previously acted as one of the Secretaries of the General Consult at Corte, by which the constitution was drawn up, was appointed, according to his biographer M. Capéfigue, President of the Council of State, that is, we suppose, the Board of Council, nominated by the King of England to assist the Vicerey. When the English abandoned Corse in 1797, he came to this country with the Vice-Admiral Elliot, (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 must date the real rise of his name, if 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 to reside at Vienna during the war, and was sent as a minister of embassy to the several Courts of Europe. After the battle of Austerlitz and the peace of Friedburg (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) and in the beginning of the year 1807 Pozzo 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 under the command of Tchernoff on the 7th of July, when the Turks were signsly 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 Forte, which was accordingly concluded on the 24th of August following. Pozzo, all whose feelings were vehemently anti-Gallienian, now obtained Alexander’s permission to travel; upon which he proceeded to Vienna, and he continued to reside there until the 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 on the 24th of December to St. Petersburg. There he remained till the expulsion of the French from Russia in the winter of 1812, when he was recalled by Alexander; and, passing through Sweden, he met the emperor, who, as a prince of the blood in the crown of Sweden, had already engaged to join the combination against France by the treaty of Petersburg (27th 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 Kaliut, was now sent therefore to urge him, at the same time 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-imperial was prevailed on to take part in the battle of Leipzig (18th October, 1813). Meanwhile, immediately after the previous affair of Gross-berlin (23rd August), Pozzo had been despatched to Frankfort, to take part in the military conventions; it was decreed in the council that, on 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 arrived in London, and was received by the minister, with whom he proceeded to Ruden, where the allied sovereigns were now assembled. He continued in close attendance upon the Emperor Alexander at the Congress of Chaumont, where he strenuously opposed the recognition of the offers made by Bonaparte, and throughout the rest of the campaign of the first months of 1814, till they had the satisfaction of entering Paris together on the memorable 31st of March, 1814. Indeed, as the possession of France was now confirmed by the restoration of the Bourbons, he 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 dethroned 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, but by his representations he procured the project thus suggested to be adopted. The congress of Vienna, however, had continued its session during this time, and, having thus 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 of 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 Wellington, to England to discuss the claims, 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 received with equal cautiousness the news of the outbreak of the Revolution of 1830; but he at last revisited St. Petersburgh in 1834. Passing on his journey thither through Vienna and Berlin, he had the Order of the Red Eagle conferred upon him by the emperor of Germany, whom he had not seen since the breaking out of the War of the East in 1835 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 back sent to England to treat with the king and government of Great Britain. According to M. Capefigue, he died at this appointment as both a mortification and a disgrace, and it affected him greatly: but M. de Nesselrode considered 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 rapprocher de l’Autriche) in the Eastern question, and should have supported the Tories in an effective manner, then M. Pozzo would return to Paris to follow his tastes and accustomed pursuits. M. Capefigue, as is 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 state to be true, says that 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.

(Extracted, with the permission of M. Capefigue, from his Correspondance; and with the permission of the publishers of the Biographie Universelle, vol. 77 (Supplement), pp. 497-507, by M. Capefigue, which has also been published separately.)

PRELATE. (Busson, P. C.)

PRESCRIPTION has, 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 had not taken place, but it in some instances creates a positive title to property. The prescription of a right of property can be established to be of a period of thirty or forty years—a period probably borrowed from the Præscriptio quadraginta annorum of the Romans. Whatever adverse right is not cut off by the other special prescriptions of shorter periods must be extinguished by prescription in thirty years. It is 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 forty years from the time when it was due. Hence, where the cause of redress is non-existent, the prescription 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 fair face of the thing it may be said, has no right, and is not charged by law, to real property, the long prescription is not applicable. It is usually stated in the Scottish law-books that it is interrupted by the minority 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 forty years, while, 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 will interrupt it. It may be observed that there is an act, by a sort of prescription, which bars all claims on such a debt. When there is in Scotland any judicial inquiry as to the antiquity of a custom, it is usual to limit the period of the inquiry to forty years, as sufficient to establish its having existed from time immemorial. The government of Edinburgh with the proprietors of land to irrigate fields with the contents of the city sewer—the system increasing until it became offensive to the neighbourhood—these proprietors produced evidence of their having 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, those proprietors have, so far as the dispute has hitherto gone, been able to defend themselves on the ground of prescription.

The other two other prescriptions 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 writs, cease to be "bear faith in" the hands of the writer: the suretyship is limited to seven years. Bills of exchange and promissory notes cease to have force after six years; but the debts which they represent, if they do represent debts, may be recovered by other actions. Theunkenial prescription cuts off all right of action, after the lapse of five years, on bargains provable by witnesses. It also protects agricultural tenants from a demand for rent after they have been five years removed from the land to which the demand is directed: the quarter's or three years' prescription, is very important. It cuts off claims on account of goods or services, the three years running from the date of the last item of the account; and also
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 Institute of Edinburgh’. The poem seemed to have been written in a fit of inspiration, and not in single words, but rather in a continuous flow, as if inspired by a sudden burst of creativity. It was widely appreciated and earned them some praise but no profit. In 1816 he was a contributor to ‘Albyn’s Anthology’, and the author of a poem in the ‘Poetic Mirror’, called ‘The Autumnal Excursion’, which was praised by Scott, 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 fairly well advanced he resigned his post in the Register Office, which he could resume if his project was unsuccessful. Among his coeditors were Lockhart, Wilson, Clogborn, Dr. Brewer, 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 Gipsies, 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 was editor, at the same time that he became joint editor of ‘Constable’s Magazine’, but disputes between Pringle and Blackwood led in a short time to a separation. Before this unwelcome change, 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 probably derived little comfort from it. Sometime in 1819, he was again on his former seat in the Register Office, performing the laborious drudgery of a copying clerk to the Record Commission.

Meet four brothers, all of whom were farmers, had become more or less prosperous, and he proposed that they should avail themselves of the government scheme of colonizing the unoccupied territory at the Cape of Good Hope. The farmers had previously expressed an interest in the scheme, and in January, 1829, he was once again in the Register Office, 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, having set sail, arrived at the Cape of Good Hope in April, 1829. On the 31st of June they reached Roodeval, on the Great Fish River, and after a toilsome march of some days arrived at their place of settlement, in the upper part of the valley of the Bavina’s River, or Riviere of Lambos, one of the smaller tributaries of the Great Fish River.

The small colony, having surmounted the first difficulties, became tolerably prosperous, and Pringle’s brother having arrived at the Cape at the end of 1832, resigned his seat, and was appointed to the post of government. His 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 government 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. Fairburn, a Dutch clergyman of the town, made arrangements for the publication of a periodical in English and Dutch. Lord Charles Somerset, however, who was the governor, 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 into 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, he 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, he was surprised to receive a letter from the governor authorizing him to commence his periodical, the plan of 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 editor, as well as of the 'Journal.' The two works were continued without interruption, and the press 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 governor had been carefully expunged; that the printers employed had taken all arbitrary powers, and having no legal means of resistance, threw up his editorship. Greig discontinued the publication of the newspaper, announcing to his readers his intention of appealing to the British government. Greig's press was immediately ordered to be scaled up, and himself commanded by warrant to leave the colony within a month. The Fasal 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 disclaimed his right of censorship, and on the 9th May, 1824, announced the immediate continuance of the work in his own hands. The society to which the king in council was got up by the respectable inhabitants, and the governor became alarmed. He summoned Pringle to appear before himself and Sir John Truter, the chief justice. He at first attempted to explain away the whole subscrip-

tion, and, failing in that, tried to cajole him, and bring him over by flattery; Pringle, however, resolutely refused to re-

consider his conduct. Magistrate received a promise that 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 governor's resentment pursued him till, finding himself ruined in circumstances of life, he moved to London, and in June, 1826, arrived in London. He applied to the government for compensation for his losses, which he estimated at 1000L., but in vain. 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 in his declining he felt a sensation as if there had been some slight abrasion of the part. This slight abrasion seems to have produced con-
sumption, and his medical advisers informed him that removal to a warmer climate afforded the best hope of his life. He was preparing to return to the Cape, and had actu-

ally engaged a passage for himself, his wife, and her sister, when an attack of consumption, operating upon his weak state of body, occasioned his death, July 23rd, 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 an author 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 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 verisimilitude is sweet, the style simple and free from all superfluous epithets, and the descriptions are the result of his own observations. His 'Afrikaner Sketches,' which consist of personal exhibitions of the country, the character-

istic habits of African, and the modes of native life in South Africa, are alone sufficient to entitle him to mean rank as a poet.

(From the General Works of Thomas Pringle, with a Sketch of his Life, by Leitch Ritchie.)

PRINOS (πρίνος is the Greek name of the Holly, which the present genus much resembles), a genus of plants belonging to the family Rosaceae, has been described. The flowers, a permanent half 6-leaf calyx; a 6-parted pericarp, 6 subulate erect filaments, a short style with an obtuse stigma, and a berry with 6 stones. 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-cleft, and persistent; the ovary monopetalous, spreading, without a tube, the border divided into 6 oblong segments. The fruit is a bright scarlet, rounded, supported by the persistent calyx and crowned with the stigma, 6-celled, with seeds red. A well-marked plant, with its outer borders and its cases of gangrene. The berries are said to be tonic, and Bigelow asserts that they are emetic.

P. glaber, Glabrous Winter Berry, has rather pubescent branches, evergreen crenate 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 'Madder 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 hard sense of this genus is well suited for shrubberies, and will thrive well in any soil, but they prefer peat. They are readily propagated by laying down the shoots or by seeds. The stave species will grow well in a mixture of loams and peat, and ripened cuttings will root in sand under a band-glass in modern greenhouses.

(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 his 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 prisms, and PQ be one side of a square object having its surfaces per-

pendicular to the paper, so that the sides while passing through the prisms and PQ perpendicularly to the paper may be parallel to the refracting edges of the prisms; also let the eye of the spec-


tator be situated at II; then the light proceeding from the surface of the square will, after reflection in the prisms, pro-

duce in the eye an image of a rectangular form, having the breadth in the direction of PQ greater than PQ, the length perpendicular to the paper being unaltered. 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 the object is equally magnified in every direction, and is quite free from colour: and it is easy to per-

ceive 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 had.

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 the inconvenience introduced by the use of telescopes of the usual construction when applied to this particular purpose.

An optical instrument, which is also called a prismatic telescope, is produced by the prisms PQ, PQ, the first two of which have the same length perpendicular to the paper, and its focus two prisms of a doubly refracting medium; thus producing two images of an object, which being, by moving...
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. Bouchon, and is sometimes employed for the purpose of ascertaining the magnitudes of terrestrial objects, or their distances from an observer. It has also been used in measuring small angular distances in the heavens.

The two prisms may be of Iceland spar, or rock crystal, and may be placed in the form of a wedge whose principal section is a right angled triangle, as ABC or A'B'C', 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'B'C' so that the edge passing through B perpendicularly 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 abc, suffer the ordinary refraction, will preserve their direction on passing through the double prism and also on emerging from thence at the surface passing through A'B', the same direction as if they had at their incidence on the opposite face; while the rays which, as c'd', suffer the extraordinary refraction, will, on arriving at the surface passing through BC, be turned from the original direction and take some other as ef to pass through the prism. According as the prism 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 the same direction as fe, as if they came from points corresponding to k in the rays of produced, and will cross the ordinary rays in points corresponding to z. An eye placed near o 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 43 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 plane having one extremity X in the axis OE; then x and y being the focus 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 x'y', in a vertical line passing through xy, the image produced by the extraordinary rays; the angle x′z′x or y'y′ being that which was denoted by ach above. Therefore, if the angular deviation of the images formed 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 to the images of the two rays an angle will be subtended some angle at the eye. If the points k and k' 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 prism O the images will separate progressively from one another, the angular deviations being proportional to the distance of k from x.

Now, on the exterior of the telescope in a direction parallel to its 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 x′z′x, 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 pass through a point O, and the other extremity X through a point O', and an index placed at O will serve to measure the line or diameter seen by the extraordinarily refracted rays.

Then, the angle which the same object subtends at the eye, in that position being determined trigonometrically or otherwise, the point at which the index stands should be numbered so as to express that angle. The like operation being performed for an object subtending a different angle at the eye, if the interval between the points at which the index stands be divided by the number of equal parts by which 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 prisms, may be measured.

The prismatic sextant, invented by Professor Amici, is described in Zach's 'Correspondance Astronomique,' tom. vi. p. 584. 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 also turns on a pivot near the prisms. The rays of light passing through 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 images of the objects from whence the rays proceed may be made to appear in an interval with each other; when the angle subtended between the objects will be rather greater than twice that which is described by the movement of the index. If the prisms are of common glass, and the broader faces of the prisms make with each other an angle of 90 degrees, the angle between the objects will be about 204 degrees.

Then, the points of this sextant are that double altitudes of the sun, when on the meridian, may be observed by it, even at the equator, and that at sea the anterior and posterior horizon may be brought in contact, and thus the amount of the horizontal refraction may be determined. It may be added that very little light is lost by reflexion, and that there is no parallax for near objects.

PRISTACANTHUS, a genus of fossil placoid fishes, from the beds of Stonesfield. (Agassiz.)

PRISTIS. Three species of this genus of fishes are mentioned 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 £2000 per annum. By an Act of 2 William IV. c. 4 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.] Apprenticeships 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 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 bound to notify the 'Lord Keeper of the Privy Seal' 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 the prize money of a non-military vessel, united in one 12th of the prize-money, paid to a master or soldier, will be paid only upon personal application, or to his wife, or child, father or mother, brother or sister, or to the agent of his regiment, or to any other regimental agent. A warrant of 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 punished by transport for life, or to serve within theIncarceration, 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 punished by transport for life, or to serve within the

The Prize Council may refer to the High Court of Admiralty matters concerning booty of war (property captured by land forces). The Prize Council may refer to the High Court of Admiralty matters concerning booty of war (property captured by land forces).
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 persons, marriages, and settlements, also on the death duties of any uncle or aunt or their descendants, 6d. per cent.; to a great uncle or great aunt or their descendants, 8d. per cent.; to any other relation or any stranger in blood, 10d. per cent. The present duty is expressed in silver, as it is in the Act of 1825. 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 1,000,000.

The following tables show the operation of the legacy and probate duties for nearly half a century; and in Porter's 'Progress of the Nation,' vol. iii. pp. 125-133, 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, Probate, Administrations, and Testamentary Inventories.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>England</td>
</tr>
<tr>
<td>1874</td>
<td>30,606,379</td>
</tr>
<tr>
<td>1875</td>
<td>31,160,487</td>
</tr>
<tr>
<td>1876</td>
<td>31,712,595</td>
</tr>
<tr>
<td>1877</td>
<td>32,264,703</td>
</tr>
<tr>
<td>1878</td>
<td>32,816,811</td>
</tr>
<tr>
<td>1879</td>
<td>33,368,919</td>
</tr>
<tr>
<td>1880</td>
<td>33,921,027</td>
</tr>
<tr>
<td>1881</td>
<td>34,473,135</td>
</tr>
<tr>
<td>1882</td>
<td>35,025,243</td>
</tr>
<tr>
<td>1883</td>
<td>35,577,351</td>
</tr>
<tr>
<td>1884</td>
<td>36,129,459</td>
</tr>
<tr>
<td>1885</td>
<td>36,681,567</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duty received in 1840</th>
<th>£</th>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>23,606,657</td>
<td>905,857</td>
<td>679,749</td>
</tr>
<tr>
<td>Total</td>
<td>30,000,000</td>
<td>1,000,000</td>
<td>679,749</td>
</tr>
</tbody>
</table>

Return, showing the Amount of Capital on which the several Rates of Duty on Legacy were paid in Great Britain in 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>Per Cent.</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>24,087,984</td>
<td>1%</td>
<td>662,773,286</td>
</tr>
<tr>
<td>2%</td>
<td>15,482,453</td>
<td>2%</td>
<td>20,716,610</td>
</tr>
<tr>
<td>3%</td>
<td>14,599,230</td>
<td>3%</td>
<td>70,653,131</td>
</tr>
<tr>
<td>4%</td>
<td>9,774,654</td>
<td>4%</td>
<td>348,364,319</td>
</tr>
<tr>
<td>5%</td>
<td>8,021,209</td>
<td>5%</td>
<td>12,666,479</td>
</tr>
<tr>
<td>6%</td>
<td>6,318,320</td>
<td>6%</td>
<td>50,804,505</td>
</tr>
<tr>
<td>7%</td>
<td>4,277,785</td>
<td>7%</td>
<td>17,719,586</td>
</tr>
<tr>
<td>8%</td>
<td>4,066,929</td>
<td>8%</td>
<td>11,813,294</td>
</tr>
<tr>
<td>9%</td>
<td>3,703,215</td>
<td>9%</td>
<td>14,759,524</td>
</tr>
</tbody>
</table>

| Total | £4,259,714 | Total | £439,419,511 |

PRO/CULUS, a distinguished Roman jurist, the successor of Nerva the father. He belonged to the school of Laboe, and was a follower of that school's defendant named Proculian from him. [Lafr. Bntics., 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, 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 respondent,' Proculus gave 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 the grandfather, in which case his name would not be the true one. It has been conjectured that Proculus the jurist is the Licinianus Proculus whom Otho made Praefectus praetorio (Tacitus, Hist. i. 46, 82, 87, ii. 39, 40, 44, 50). Proclus is often cited in the Digest, and he is especially mentioned in a Descript of the Div. Fines as one of the eminent authorities (Dig. 37, tit. 14, s. 17). There are thirty-seven excerpta in the Digest from a work of Proclus, entitled Epitome, of which there were at least eleven books (Porson). If Proclus the jurist is the Licinianus, this is an only eight. One of the excerpts (Dig. 33, tit. 6, s. 16) has the title 'Proclus, libro iii. ex Posterioribus Lebonici,' which appears to be a separate work or commentary on the Posterioribus Lebonici. It is possible that Proclus is the same as Proculus Laboe (Dig. 33, tit. 7, s. 4), it is conjectured that the title of s. 16 (Dig. 33, tit. 6) should be 'Javolemus.'

PROCURUS, the original name given by Sorcery to a large group of fossil Brachiopods, most frequently found in the mountain-limestone series. Productus and, for part of the group, Leptura and synonymously.

PROMULGATION. Promulgation is from the Latin Promulgo, which is equivalent to Promulgo, and means 'to make public.' The modern sense of Promulgation of a Law is the making of it public by bringing it before the house of parliament in some 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 which being not to be notified, may be notified and read for that purpose, as is done with regard to resolutions, and such acts of parliament as are appointed to be publicly read in churches and other assemblies. It may hastily be notified by printing, 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 and long usage,' it is a mistake to say that it supposes a previous publication. A law does not make itself make law: the usage must be pronounced to be law by some competent authority, and that is the only promulgation which it has. Promulgation by proclamation is very ineffectual: it only reaches those who hear it. Furthermore, a law 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; and if they heard it read, very few would understand it. Proclaiming is at present the least efficient means of promulgating a new statute; but to all those who cannot read it is inefficaciously, 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, from the moment that the statute is 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 of the parties to 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.

Promulgation of a law among the Romans meant the placing of the bill (ruggia) 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 solution of sulphuric acid, and to give the patient an easy mode of passing the passage of the bowels. A white of egg is a more prompt and generally more accessible antidote. The employment of iron filings to absorb fortior exhalations from the feet is less beneficial than that of 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; that is, here stated, and in the 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 annoyed and dislodged by the nitrogenous propensities of the iron. This is an erroneous view. (Antichymisty, P. C. T.) Tincture of sesquichloride of iron in infusion of quassia is extremely...
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 at times in doses so large as to be dangerous, and this dose is inadvisable.

The black oxide is not so liable to objection, as it is more 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 sesquioxide of iron, is extremely valuable, as an emmenagogue; it is likewise very beneficial in checking menstruation, proceeding from relaxation of the uterus. It checks hematuria 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 sinking which it causes, renders patients averse to its repetition. It acts as a potentiating agent when employed externally or to mucous membranes as an injection.

The dose can be given in small doses, in pills or otherwise. Its powers are often much heightened by combination with sulphate of quinia. In nervous debility and indigestion this form is valuable.

Feo ferri, which has less unpleasantness of taste than most of the other preparations of iron, and is therefore more acceptable to children, to whom also the viennin ferri is much preferred. Both these are nearly superseded by the citrate or ammonium citrate of iron, which is more acceptable.

The latter given in warm water or lemonade is relished by most children.

Indo 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 unjustly excluded from it. In the phosphtic diastases of fecal 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, Soda-citrate, Zinco-citrate, Magnesio-citrate, Ferro-citrate, and Citrate of quinine and iron; this last is of great service in tie doloureux.

Chalybeate waters often furnish the best medium for administering iron; especially when the iron is associated with a carbonic acid. When no free-carbonic acid is present, and in some instances even where it exists, the water of the springs should be received in and drunk out of 14 day.

This often prevents the spasm which is apt to occur when water is suddenly taken in the stomach.

Besides being reputed an antidote to the poisonous salts of copper, iron is asserted to prove an antidote to other violent poisons.

Hydrate of peroxide of iron, called also hydetared peroxide of iron, is considered a trustworthy antidote against arsenic, if administered promptly, while the arsenic is yet in the stomach, and not absorbed. Prussie acid may be decomposed or combined, so as to be rendered innocuous, by giving promptly, first, solution of carbonate of potass, followed by a very diluted solution of the proto-persulphate of iron; the other to be followed by a ferro-persulphate of potass in the stomach.

(See London 5th October, 1844, or 'Pharmaceutical Journ.' vol. iv. p. 373.)

Physiological Effects and Therapeutic Employment of Iron.

—Iron exists both in plants and many animals, as the manganiferous 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 into the stomach. Upon the living tissues iron has 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 thereby increased from the incorporation of these 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, chalybeate occasion at times, especially if in large doses, pain of the epigastrium, nausea, fulness and eructations, and great anxiety; consequently referring to the injurious 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 counteracted by the substitution of tepid or cold, in place of hot, water, or by increasing the 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 excitation, accompanied with a sense of heat in the lower belly; in others it occasions colics and frequent alvine defecations; while with a third set of persons none of these effects follow its administration.

During the use of iron the fauces invariably become blackened, which is caused by the tannin of our food acting upon the iron.
man edifice and colonnades within the court, and giving the exterior the aspect of a fortress—the propylaea of the Greeks were detached structures placed in advance of the sacred edifice itself, so as to mark very conspicuously the approach to it. Like the Athenian propylaea, those at Athens and the Acropolis 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 to the temple of Athens. The order of the propylaea repeats, by the by, and sameness of design do not say much for invention on the part of the architects, or for the capability of the style employed by them to impress distinct characteristic marks on each front, is a question, and the gateway conducting to it; unless we would rather suppose that the kind of prefiguration above hinted at was aimed at directly and studiously.

The general arrangement and character of a Greek propylæum may be described as similar to those of an amphistyle 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 pronaoς of a temple, was larger than the other; so that the whole may be more freely, if not more entirely, understood by the phrase the pronaoς and opisthodomus of an amphistyle temple, put together without any intervening cells, being separated only by the wall whose two sides, in which were as many open doorways as there were intercolumniations in the important façade.

Such was the disposition of the propylæa both of the Pantheon at Athens and of the temple of Eleusis, the only two examples of Greek temples at Athens which have been preserved, that is, so only by the drawings of it in the restituted antiquities of Athens: there were: indeed, as we learn from Pausanias (ii, 3) propylæum 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 Pausanias, P. C. (vol. xvii. page 288, col. 2), which shows its relative position to the temple itself—an irregular one, the two buildings not being, by the by, in the same plane. 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 on which an ascent of steps led up from below, and above which the porico and the two lesser colonnades 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 colon- nades on the sides, the first (of 19 feet 6 inches high, and 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. The arrangement of the steps above is much more irregular, the lower flight of steps existing of which however there now exists no trace, they having been destroyed to make way for a Turkish battery to defend 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 Chioslzer, from an inscription, to have been that of Agrippa, therefore it is probable that the other was that of Augustus), which, though later additions to the struc- ture, must have greatly enhanced the general appearance of the architectural ensemble.

Another of the remarkable circumstances which served to distinguish the Propylæum from a portico is that in the western or outer division there were two rows of inner columns placed not parallel with, but at right angles to the columns in front, and in a line with the two middle ones, thereby dividing the plan naturally into three distinct consid- erations, the centre one narrower than the other two, and forming an avenue to the principal doorway, which was the largest and longest of the five openings in the transept, and the two end ones the smallest. These inner columns, too, in the case of being of the same order as the exterior, were Ionic,—a very remarkable peculiarity, inasmuch as it evidences an intention to introduce the Doric order of architecture. The licence—so to call it was, however, fully justi- fied by the circumstances of the case, because columns of lesser diameter than the external ones were required, and also of such height as to reach the architrave solitio of the internal ceiling, which are in line with the top of the architrave of the external order.

The Eleusian propylæum resembled that of the Acropolis in nearly all particulars, except that it had no wings attached to it, like the Athenian. The space occupied by the Doric order had the style on both fronts, and had six Ionic columns within, similarly in two rows.

As modern structures partaking of the ancient Greek propylæum character the Capitoline Temple of Cæsarean-Roman date at Teicneæa 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 is of both fronts, is a suggestive imitation of the Greek form of extraordinary magnitude. Both the modern examples, however, differ from the ancient ones in being entirely open, without any internal transverse wall; and the Italian has, moreover, a large open portico on each side, forming a passage through it in that direction.

PROTEA TeA PROTEACEEE. [Xylonomem, P. C.]

PROTEA. [Chemistery, P. C. S.]

PROTEST. [Parliament, P. C.]

PROTOCOCCUS. [Snow, Red, P. C.]

PROPTOAPERIUS, a genus of fossil plants, from the coal formation, includes Sigillaria punctata of Droniniati. (Prel.)

PROVIDENCE, O. I. D., is an island in the Caroline Sea, about 205 miles from the Mosquito Coast, and between 18° 19' and 18° 29' N. lat. and 81° 29' and 81° 28' W. long.

This island is nearly four miles and a quarter long, and two and a half in its breadth, that is, of an irregular oval shape.

The highest ground near the centre of the island rises to 1190 feet above the level of the sea, so that it can be seen from the shore.

From this point other hills, mostly wooded to their summits, rise to a height of a half a mile, and terminate in a bold coast. Separated from its northern end by a cut or channel of from forty to sixty yards wide, is the island of Santa Catalina, 1800 yards long by 1800 in its greatest breadth, forming the northern boundary of a harbour in Old Providence which affords secure anchorage in two to three and a half fathoms.

These islands are surrounded by an extensive bank of coral and coarse sand, which stretches to the northward a distance of ten miles and a half. The larger part of the island is unfit for cultivation, owing to its being extremely hilly. But the soil is very productive, and affords rich crops with very little cultivation. Cotton is the chief object of cultivation, and is annually exported to the amount of 30,000 pounds; the sugar-cane and coffee are also grown, but only in sufficient quantities for the consumption of the inhabitants.

Of various kinds, such as sapodillas, mangoes, oranges, tamarinds, plums, and limes are plentiful, and also coconuts. Yams and plantains are extensively grown, and afford the principal food. Seabirds and sea-fowl are prolific in number, and the shore is supplied with sea-fowl, which are paid for by the traders from Jamaica with calicoes, cloth, and a few articles of cutlery.

It is not well known when this island was discovered and taken possession of by the Spaniards. In 1664 it was taken from them by the famous buccaneer Manantel, who considered it well adapted to be the head-quarters of the lawless band of which he was the leader. After his death Morgan kept it, and fortified the island of Santa Catalina, but he left it when he was appointed deputy governor of Jamaica (1672).

After that time it appears only to have been visited occasionally, and remained uninhabited until 1795, when a few families from the New World settled there by the permis- sion of the Spaniards. From this time to 1817 it remained quite tranquil, when General Avery, a bold and energetic man, who had become a pirate, took possession of it and repaired the principal buildings of the bay, collected for his predatory excursions, was brought to this island, where a con- siderable trade was established. At his death (1822) the pirates dispersed, and the island returned to the dominion of the republic of I. D., and the population amounted to only 324 persons, about one-half of whom were slaves. They employ themselves principally in catching turtle, and they visit with their three vessels, from ten to fifteen ton burden, the bay of Old Providence, and speak the English language.

PRUNELLA, a genus of plants belonging to the natural order Labiate. It has two inferior stamens. The filaments bifid, one branch barren. The anthers all 2-celled. The ovary 3-celled, with 3 styles and 3 fruits; the fruit is a capsule, plump and inflated, the calyx is immediately closed and compressed, the upper lip flat, truncate, 3-toothed, the lower lip bifid.

*P. vulgaris*, Self-heal, is a native of Europe and Asia, very plentiful about dry sandy tracts in England. The leaves are stalked, ovate or oblong, toothed or deeply pinnatifid, the upper lip of the calyx with short truncate mucronate teeth, the lower lip with ovate-lanceolate mucronate teeth, the two lower lobes being set apart with a straight spine-like root at their 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 our medicinal systems for astringence and inflammation of the fauces. Its repuse 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 large, 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 moist situation. They are readily propagated by seed or division.

*P. montana* var. *hybrida* is a British species, New British Botany; Lindley, Vegetable Kingdom.)

PRUSSIC ACID—Medical Properties of. This acid, termed also hydrocyanic acid, has been described according to its behaviour in the human organism and 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 unsuited for present 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 enhydris is always of definite strength), over which, in general, the methods of preparation 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 with what preparation will be employed in compounding the prescription.

As it undergoes decomposition by time, especially if exposed to the light, and is readily volatilised at a high temperature, it is kept in the dark 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 shaken 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. All bottles containing the acid 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 upon the utility of Prussic acid. Subsequent experience 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 medical practitioners.

Such is the case with those who know its properties should furnish a salutary caution to all persons against employing it on their own responsibility. The diseases in which it has been most regularly employed are, however, the production of the local inflammation, 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 works, even emanating from medical men, large doses are recommended, and the caustic nature of the vapour, extracted from Conium than from this acid. Some affections of the stomach receive signal relief; others derive not the least benefit from it. The explanation of this appears to be that prevention of the aggravation of the disorder, as well as its seat, are in the stomach itself; while in the latter the pain is felt chiefly in the stomach, but the cause is in the spinal chord. Treatment directed to the spine will in general quickly and often permanently relieve it (Tuttle’s *Treatise on Neuralgic Diseases*). Cutaneous diseases are alleviated by lotions and ointments containing hydrocyanic acid. But the cautions above given must be carefully observed during their employment.

The most useful hints which can be here given relate to the treatment of poisoning by prussic acid. So soon as it is ascertained or suspected that any one has taken an over or poisonous dose, cold water should be dashed over the head and back. The vapour of ammonia (common smelling salts) or of chlorine should be applied to the nostrils; or very dilute liquor ammonium may be blown into the stomach. While these things are doing, other persons may prepare a weak solution of carbonate of potash (common pearlash will answer); and some sulphate of iron (coppers) is to be dissolved in a large quantity of water. Some of the solution of the carbonate of potash is to be poured over the patient followed immediately by some of the solution of coppers. This, if done promptly, will save the patient. Artificial respiration, if specifically resorted to, is useful, as is likewise bleeding from the arm. If possible, give a purge.

*PSALIODUS*, a genus of fossil fishes, from Sheppy, (Erseston.)

*PSAMMOMUS*, a genus of fossil shelled animals, from the mountain-lime stones of Bristol and Arungho (Arund.)

PSEUDOLIVYA, a genus of Gasteropoda, which includes one fossil species from the London clay. (Sowerby.)

PSI/DSIUM (from φυσ, the Greek name for a pomegranate), a genus of plants, common to Egypt. It has not been observed to cause symptoms of poisoning. The tube of the calyx is ellipsoid or obovate, usually contracted at the apex; the limb oval, undivided, but afterwards to 1- to 5-cleft. There are five petals and numerous free stamens inserted in a broad circle, almost through the whole undivided part of the limb; the style is filiform, the stigma capitulate: the ovules are numerous, horizontal, and fixed to the margin of the placenta; the berry is many-seeded, cordate by the tube of the calyx, and crowned by a large calyx. The seeds imbedded in the pulp in the mature fruit with a bovy testa. The species are trees or shrubs, natives of America within the tropics. The fruit is edible, and is known by the name of Malpighia. It has a fragrant and very sweet, very rapid taste, and is eaten both raw and when made into jelly.

P. pomifera, Apple-bearing or common Red Guava has tetragonal branches, oval or oblong lanceolate leaves, unscented beneath, from 3 to 8 peduncles or many-flowered. The fruit is globose, yellow, and somewhat astrigent, with an agreeable odour; the root and young leaves are astrigent, and are esteemed strengthening to the stomach. It is native of the West Indies, Mexico, and South America.

P. montana, has tetragonal branches, oval oblong leaves, acuminate and quite glabrous; the peduncles many-flowered, and the fruit roundish. It is native of Jamaica on the mountains. The fruit is small, acid, and smells strongly like bitter almonds, hence it is called *Ambrodon*. The wood is very hard and of a fine colour and grain. It works well, takes a fine polish, and is much esteemed for ornamental purposes. The species of *Guava* grow freely in a mixture of loam and peat. Cuttings will strike root in sand with a hand-glass over them. Some of the species bear fruit in the stoves of this country, but they are hardly worth the trouble of growing for this purpose.

(Don, Gardener’s Dictionary; Burnett, *Outlines of Botany*.)

PSYCHODRAGMARIA (from *γυναίκη*, woman, life, and *δρακός*, a dragon) the powerful medicinal properties of one of the species of a genus of plants belonging to the natural order Chironiaceae and the tribe Coffee. The limb of the calyx is 5-lobed, 3-toothed, or nearly 5-toothed, with a single tooth situated near the limb spreading or recurved, the throat bearded or gla- trous. There are 5 stamens, the anthers exserted or en- closed. The berry is drupaceous, crowned by the limb of the calyx, furnished with 10 blunt ribs in the dried state. The
species are small trees or shrubs, natives within the tropics; they are very numerous and intractable.

P. aquilinum has the leaves of the host in a broad, shallow, and branched root with a slender axis, and a thick friable back. It is an erect simple

hairy under-shrub, with oblong lanceolate leaves narrowed at the base, membranous or elate, rather plane beneath; stipules are small and very short. The pedicels are axillary and few, flowered somewhat racemose and white. It is the psevechana supplied by South America, and is the stunted psevechana of some authors. The root possesses similar effects on the brain, and is much used in the treatment of hysteria, and contains, according to M. Pelletier, 9 per cent, of cinantnine.

P. nozii is a native of Brazil, with compressed branched

furnished with two rows of hairs; the leaves are lanceolate, acuminate, and recurved. The stipules are short, bipartite, the flowers 2-4 in a fascicle, sessile, bracteate, terminal, and axillary. This species is accounted poisonous in Brazil; it is known by the name of Erva de rata, and is used for the destruction of rats and mice.

P. speciosa is employed in Brazil in the same diseases as

marapanda; and P. tintoria 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 peat, sand, and cuttings will strike root readily if planted in sand underneath a hand-glass. Some of them bear handsome foliage, but the flowers of all are insignificant.

(Don, Gardner’s Dictionary; Lindley, Flora Medic. Lindley, Vegetable Kingdom.)

PSYTHIRUS, a genus of Hypnumcicous insects of the family Anipida and division Sociales. It includes certain humble-bees structurally incapable of forming their own nests, and considered parasitic by St. Fargeau, the entomologist who established this genus.

PTARMICA, a genus of plants belonging to the natural order Astereace. It has a campanulate involucre with the scales brown and scoriaceous at the edge. The receptacle is flat or scarcely convex, broad, and paleaceous. The ligules from 5 to 20, flat, extended, much longer than the involucre. The achenia are bald, echiniform, the outer often somewhat winged at the edge.

PTEROCARPUS is a genus of plants widely creeping, root very difficult to extract, when the soil is moist. Upright stems about two feet high, angular, smooth, hollow, leafy, with small axillary rudiments of branches corymbose at the top. The leaves are sessile, linear, or slightly lanceolate acute, very minutely verrucous but with little teeth. Smooth on both sides and of a dark green. The flowers are millimetre, larger than most others of the same genus. The whole plant is pungent, and probably to one minute minutizes they become almost smothering; but this is thought to be owing to their little sharp marginal teeth; the root is aromatic. The heads of P. nova, atrata, and moschata are used in the Swiss Alps as a substitute for tea. Moschata is the basis of the aromatic liqueur called Esprit d’Eva.

(Lindley, Veget. Kingdom; Lindley, Flora Medic.)

PTERIDACANTHUS, a singular genus of fossil ganoine faunites from the old red-sandstone of Scotland and Orkney. (Agassiz.)

PTERID/MEA, a fossil genus of Cochlicers, allied to Avicula, and hitherto confined to the Palaeozoic, and chiefly found in the Devonian strata. (Goldfuss.)

PTERIS (from pteron, a wing), a genus of plants belonging to the natural order Filicae. The thecae arise from the points of veins placed on a nerve-like receptacle running along the edge of the leaf, forming an uninterrupted marginal sorus; the involucres are continuous with the edge of the leaf, scarios, and opening inwards.

P. aquilina, common Fern, or Braken, is the most abundant of the species. It has a long tapering creeping rhizome, externally black. The leaves are erect, from one to six feet high, repeatedly compound with horizontally spreading divisions, whose ribs are smooth; the primary leaves are nearly 1 inch, and pinnate; the secondary divisions oblong, obtuse. They are all a light bright green color, slightly brown at the edge, which is revolute and crisped, or wavy, shielding the dense linear masses of tawny scales below. The root is tough, rough, and very strong, but simply scarios. This tree is thought by Roxburgh to be the one yielding gum kino, a well known astrangent,—the juice hardening into a dark red and very brittle gum resin, which, on being powdered, changes to a light brown, very astrangent, the powder being somewhat strong, but simply astrangent. The red kino-tree however appears to be the next species.

P. arborescens is a tree 40 to 50 feet in height. It has un-equally pinnate leaves, 9 to 11 in each leaf, beginning 1 to 11 to 15 leaflets, alternate, distant, on short stalks, ovate, oblong, obtuse, or emarginate, warty at the edge; lanceolate stipules, solitary or clustered rhacemes, downy from the old wood below, the flowers in the leafy axils. The flowers are yellow, the foliage stipulate, compressed, membranous, velvety, serrate, and undulate, prickly on the centre. When the branches are wounded, a clear bright gum exudes from the中断, the root is known to the native as gummer, and is mentioned as such by Mr. Mango. It is

indicative of poor soil, but it is more probable that its

absence from cultivated ground is to be attributed to the effects of the heat and the alkaline character 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 Africa. It is used in many parts of England for keeping people in health, and in the islands of Ireland and Scotland, and persons who live in those countries gain considerable profit by collecting the leaves, and selling the ashes to soap and glass makers, on account of the large quantities of alkali contained in them. As a litter for rats and other vermin, and as a substitute for the

mass, this species is used for polishing leather. It is highly esteemed in South America for the manufacture of the root with luxury.

(Steele, British Ferns; Babington, Manual of British Botany; Lindley, Flora Medic.)

PTEROCARPA, from wop, a wing, and adma, 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 into a papilionaceous form; 10 monadelphous or diadelphous stamens, an irregular indesiguin legumen, somewhat orbicular, surrounded by a wing, woody, and often rugose, in the middle 1-3-celled. The leaves are unequally pinnate. The racemes axillary, or forming terminal panicles. The species are unarmed trees or shrubs.

P. Draco, Dragon’s-blood, and Psychotria, 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 leaves nearly smooth. The wood of this tree is white and heavy, the bark thick and of a very 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 hours, it is rare and clear, and the wood is used in the middle 1-3-celled. The leaves are unequally pinnate. The racemes axillary, or forming terminal panicles. The species are unarmed trees or shrubs.

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a very powerful remedy in obstinate chronic diarrhoea and dysenteries, and in all diseases arising from laxity of faeces. Externally it is applied to those parts to check hemorrhages from wounds and ulcers, and to diminish discharges.

_P. sanctius_ is a lofty tree having alternate stalked ternate leaves, petiolate alternate leaflets smooth above, hoary beneath. The flowers are yellow, simple, and oblong in perfect. The legume roundish, stalked, falcate upwards, compressed, smooth, keeled on the lower edge, the keel being prominent and unrolled. From this name is obtained the Red Sallee. The timber is chiefly consumed by dyers and colour manufacturers of the present day, but which is also used to colour several official preparations, such as compound tincture of lavender. Its colouring matter forms beautiful coloured powders for dying silk and other metallic substances.

_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 hand-glass in heat.

(Don, _Gardener's Dictionary_; Lindley, _Flora Medica_; Burnett, _Outlines of Botany_.)

_PTEROPHYLLUM_, a genus of fossil Cycadea plants from the siltite of Yorkshire and beds of the same age in Scania. (Brockman.)

_Acanthoceras_, a genus of fossil corals from the Silurian strata of South, Westmorland, and Tyrone. (Lonsdale.)

_PTYXACanthus_, a genus of fossil placoid fishes from the old red and mountain limestone strata. (Agassiz.)

_P. temate_, a 320 genus of _Cephalopoda_ from the fault of Folkstone. (D'Orbigny.)

_PTYCHOUS_, a genus of fossil fishes from the Cre-taceous system of England. (Agassiz.)

_PTYCHOLEPSIS_, a genus of fossil ganoid fishes from the _flora_ of England, &c. (Agassiz.)

PUBLIC HEALTH. On the 14th May, 1838, the Poor Law Commissioners presented to Lord John Russell, then Secretary of State for Home Affairs, a Report by Dr. Arnot 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 19th 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 July, 1842, the Report of the Poor Law Commissioners was laid before Parliament by the House of Commons. A '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 and Wales,' prepared 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 these 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 Intemperance in Towns,' by Edwin Chadwick, Esq., was presented.

On the 9th of May, 1843, Commissioners were appointed by the Queen for the purpose of 'inquiring into the present state of the large towns and populous 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 for the preservation of health, and the usages 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 protection of property from fire; and how for the public health and general good the sanitary condition of the population of the people of this realm, and the salubrity and safety of their dwellings, may be promoted by the amendment of such laws, regulations, and practices.'

The first Report of the Commissioners was presented to both Houses of Parliament at the end of June, 1844. The Report is accompanied by 437 folio pages of evidence on which the Report is founded, an Appendix of Special Reports on the sanitary condition of several districts, among the important of which are—Liverpool, by W. H. Duncan, M.D.; Ashton-under-Lyne, by John Ross Coulthart, Esq.; the City of York, by Thomas Laycock, M.D., and Nottingham, by Thomas Playfair, M.D., and Thomas Slaney, Esq., and the reports of the Commissioners of the Supply and Filtration of Water, on the Obstacles to Improvement in the Structure of Buildings, on the Cleansing of Streets and Buildings, and on the application of Reforms. 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 State of Birmingham and other towns, by E. A. Slaney, Esq., Commissioner 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 inquiries 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, and of the poor are among those the 'Health of Towns' Association, of which the Committee includes noblemen, dignitaries of the church, members of parliament, and other gentlemen. They have published various Reports on the Unhealthy Towns, their Causes and Remedies, delivered at Crosby Hall, London, by William Augustus Guy, M.B., Physician to King's College Hospital; a Lecture on the Unhealthy Towns, its Causes and Remedies, delivered Dec. 10, 1845, at the Mechanics' Institute at Plymouth, by Vicecorm 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, scrofulous and other chronic complaints, mostly arising from causes which might have been prevented, are found to exist to an extent which it is difficult to comprehend. The causes of sickness are generally most numerous and most intense in the crowded districts, and the mortality is found to be, with few exceptions, in proportion to the density of popula-

The average annual mortality in England 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, on an average, were found to contain 580 persons; and in some of them the population reached 600 or more.

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 2.07 per cent., or 1 in 45. In healthy districts it is 2 per cent., or 1 in 50. In the metropolis the deaths are 1 in 39; in Birmingham and Leeds 1 in 37; in Sheffield 1 in 32; 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 34. The mortality was found to be greatest in cities than in any other town in England. 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 63,345 persons. In these courts 1300 were occupied by persons, whose persons were crowded in the same manner as in the metropolis.

The average of the whole country is 3 per cent., and in any city, town or village it is only 2.3 per cent. The sanitary condition of the metropolis for 1824, the age at death of the city, the tradesmen, and the working classes, who died at the age of 15 and upwards, Mr. Guy ascertained that the average lived 39.8 years, and the working classes 48. In 1844 the deaths in the metropolis were 50,423. If the rate of mortality had been 1 in 60.
instead of 1 in 39, the deaths would have been only 40,146, 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 of inhabitants 27,000 die every year in the large towns, and almost 3,000,000 in the smaller towns.

The large towns have already begun to make improvements. The improved drainage in twenty streets of Manchester has been found 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 to individuals and the community, are not the only considerations to be adverted to. Not only the sickness which precedes death, but the sickness which is cured, renders the suf-ferers incapable of following their usual occupations, and obliges them and their families to seek relief from the parish, and from public 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 courts-levy by ancient usage is resorted to in a few towns for the abatement of minor nuisances. Mr. Coulthart gives a detailed description of the various matters which have been taken cognizance of by the leet jurys at Ashton-under-Lyne, Rochdale, and Wigan. But the only practicable body to deal with them are the local authorities. In most places, however, the exercise of these powers has fallen into desuetude, even where the courts still continue to be held.

The measures necessary to be adopted in order to improve the sanitary condition of the inhabitants of the southern and central populous districts are comprised under the following heads:—

1. Drainage, including house and street drainage, and 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 distinct 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 reason on which the recommendation is founded. We can only afford space for a summary of these recommendations which follow:

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 a 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; investigations by authority of the crown, on report; assessment of lands; priorities; no sale of full or half interest in 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 when house is let in separate apartments, or otherwise, for income or rate; and no more than once a quarter, or when the yearly rent is less than 10l.; providing 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 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 draining; but that it be performed by the local public officers.

No. 13, 14, and 15, relate to the Cleansing of all privies and cess-pools at proper times and on 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 cleansing the streets, securing 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 under the local administrative body; the establishment of water-meters, the making of the rate according to the water used, and especially recommending that the supply of water in the mains be not only constant, but as high a pressure as circumstances will permit.

No. 22 recommends 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 offices for public assembling and reposing especially in churches.

Nos. 27 and 28 recommend that power be given to the local administrative body to compel landlords to cleanse houses duly reported to be in a nuisance state from filthiness—and that power be given to the magistrates to license and issue rules for regulation of lodging-houses for the reception of vagrants, trampers, and persons of similar wayfaring habits.

No 29 recommends the appointment of a medical officer in each town or district, who shall report periodically on the sanitary condition of such town or district.

No. 30 establishes 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 entirely away with the water-buts; and contending that in most cases such a constant supply is not only more economical, and the water runs away but 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 these inquiries, and signifies nothing more than that the law should be consistently carried into effect. An example will best explain how they are applied. One man may agree with another for a certain sum of money, that the man is to carry up to any premises in which he carried on some trade, art, or business, and agree that he will not carry on the same within the limits of England. The object of the bargain is to secure to him who pays his money, all the benefit which might otherwise result 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 at the Land's End or Newcastle-on-Tyne, or in the original place, or in another 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 not exercise his 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 order that another individual may have an advantage which it did not possess before. 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 taken into the account in forming a judgment of the validity of the contract, or, by a libel, to be taken into the account in forming a judgment of the validity of the contract, or, by a libel, to be taken into the account in forming a judgment of the validity of the 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 taken into the account in forming a judgment of the validity of the contract, or, by a libel, to be taken into the account in forming a judgment of the validity of the 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 taken into the account in forming a judgment of the validity of the contract, or, by a libel, to be taken into the account in forming a judgment of the validity of the contract.

Still it may be said that there are contracts which ought to be declared void for reasons of public policy, or, to use a more correct expression of Lord Hardwicke, reasons of public utility (Earl of Chesterfield, &c., versus Sir Abraham Jannsen, 2 Ves. 155). Lord Hardwicke observes, 'Particular persons in contracts shall not only transtact bond fide between themselves, but shall not transact mold 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 parties contracting are concerned, it is properly said to be their interest to have the contract prohibited. A merchant is sued for a spiritium contracted to be given for preferring or recommending to public office or employment; none of the parties are defrauded, but the persons having the legal appointment of those offices are thereby prevented from receiving the benefit; if the case be one in which the person recommended is a fit person, and no damage is caused by the bargain to give a premium.'

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But though it may be urged, as Lord Hardwicke would argue, that damage to the public service may be caused by such bargains, and we may admit that generally it would be so. it cannot be completely ascribed to the public, because perhaps not the best ground on which to assume the invalidity of such bargains. If the person who has the appointment to a place in the public service receives the power of appointment, and if it is not clear that he is not entitled to profit from the appointment, any premium that be might bargain for would clearly make the bargain illegal; because the thing is not a subject of bargain or sale. The same reasoning applies to any other person whose recommendation may help another to an office, by the supposition the office is not a thing that can be the subject of bargain and sale. (Comparo Inst. tit. 10, 2.)

PULICA RIA, a genus of plants belonging to the natural order Asterolaeae. It has an involucre late imbricated in few rows. The pappus in two rows, the outer one short, cupulate, membranous, and toothed, the inner one plume.

P. lindleyi, is found in the average of the autumn. It is a slender, yellowish plant, with a slender stem. The leaves are linear, and the flower-heads are small, and the flowers are white. The flowers are numerous, and the fruit is a small, round, black, ribbed, and spiny. It is found in moist sandy banks in Great Britain.

PULMONA RIA (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 with the natural order Cynoglossae. It is a small genus of herbs found in the north of Europe. The flowers are white, and the leaves are linear. The plant is found in damp places in Great Britain.

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PURCHASE, which is corrupted from the Latin word Perquisatio, is defined by Littleton (1:12) to be the possession of things, where the person that buys them is an agreement, unto which possession he cometh not by title of descent from any of his ancestors, or of his cousins (consanguine), but by his own deed. Purchase as thus defined comprehends the purchase of land by deed or agreement, and not by descent; 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 comprehended when land is bought by title. This species is a herbaceous plant with spotted leaves and terminal corymbous racemes of flowers.

P. officinalis, Langwort, has ovate leaves, roundish or cordate, the upper leaves oblong. The root is thick and black. The corollas are red before expansion and then purplish. 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 Caspian. The leaves, which are the parts of the plant recommended in medicine, have no peculiar smell, but in their recent state manifest a slightly astrigent and mucilaginous taste,—hence they are supposed to be demulcent and pectoral, and to have a cathartic effect in consumption. All these plants contain nitre in considerable quantities, and when burnt this species yields one-seventh of its weight in nitre. In the north of Europe it is eaten as a potherb, and according to How it was brought to table in Scotland.

P. angustifolia has all lanceolate leaves. It is difficult to distinguish from the former species, but is more pubescent, and has narrower spotless leaves. The corolla is purple, and the flowers are white. The leaves are linear. All the species of Pulmonaria are pretty plants when in blossom, 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 propagable by division. Most of these species grow well under the drip of trees and in moist situations.

(Don, Gardiner's Dictionary, Babington, Manual of Brit. Flora, and Dictionary of Botany.)

PUNCTUM CAECUM, in the eye, is the part of the surface of the retina which is immediately adjacent to the optic nerve. At this point the optic nerve leaves the eyeball and receives 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 images. Its existence in each eye is proved by a well-known experiment, which was first made by Marriotte — on a dark ground, as a black board, in a vertical position, place on a level with the eye a white paper, and at such a distance that it is against public policy might be determined on some legal principle, which should not require the introduction of the principle of determining that a contract shall be void because it is prejudicial to the public. (Mailan v. May, M. & W. L. 662.) If the validity of a contract is to be determined on this principle, it is very difficult to say what limits must be set to its application.

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PYRANE, a genus of Gasteropods, which includes two species, lived near Hadrian Bridge. (Brown. Man. Geol. Trans.)

PYRETHRUM (from πυρ, fire, because of the hot taste of the root), a genus of Composite plants belonging to the tribe Asteraceae. It has a hemispherical involucre, the receptacle flat or convex. The fruit angular and winged. The papus is an elevated membranous border.

P. Parthenium, Feverfew, has stalked pinnate leaves, with ovate or oblong segments, the base of a hoary green, the leaflets inflexed to ovate decurrent and cut. The flower-heads are erect, about half an inch broad, with a convex yellow disk, and numerous short broad abort 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-hysteric. It was once a popular remedy in ague. It is said that the odour 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. vulgaris has pinnate leaves, in numerous apical pointed segments. A branched stem, solitary head, the involucral scales lanceolate obtuse; the fruit rugose with two round glandular dots on the external face just below the beak of the nut-like seed. It is found in fields and waste places in Great Britain.

P. argyranthemum has sessile doubly pinnate leaves, with fleshy segments, convex above, keeled beneath. The stem differs from the others. Sulphur is deposited on the root, and this is followed by 2 elongated glandular spots on the external face, just below the elevated lobed border. It is found on sea-shores in Great Britain.

Plant. See the botany of Spain, once much esteemed as a salve and resort to it for relief in toothache. Grew says that when the root of pyrethrum is chewed, it makes a sensible impression on the tips, which continues like the fumes of brandy. It possesses more powerful effects on the stomach. When extracted, the scirr 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 typhus fever by the Indian practitioners. (Burnett. Outlines of Botany. Lindley. Flora Medica. Brevignon. Manual of British Botany.)

PYRNA, a fossil genus of Echinodermata proposed by De Moulina for the Echinoidea degrassi of the green-sand.

PYROGEN is a term very recently applied to the electric fluid, derived from the Greek word πυρ, fire. The views of Mr. Lake, who first proposed it a short time since, are novel, and certainly deserve attention. He maintains that there is no name because there appears to be a degree of indeterminate ness in the terms electricity, electric fluid, &c., and hoping that he has produced sufficient evidence in support of its maintenance. He considers that the term 'pyrogen' might be advantageous. If this or some similar name were adopted. Electric might have been used, but as the fluid has no more connection with water (aqueous) than many other substances possessing like properties, he has chosen to propose an entirely new name; and as it bears the greatest resemblance to fire, and seems to have a most intimate connection with that element, the word 'pyrogen' 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, removes large blocks of stone out of their places, drills holes in metal vessels, and occasion earthquakes), it must be matter, as nothing of an immaterial nature can produce mechanical effects upon material bodies.

He also says, to declare the material nature of electricity from the above considerations, and a simple experiment with a galvanic arrangement, consisting of a pair of plates 2 inches by 4 inches, in a half-pint drinking-glass, in which was placed, at the bottom, a solution of copper, joined together and insulated by non-conducting materials. From this arrangement and the wires being insulated, the fluid could not have proceeded from without, and he considers that it was developed on meeting the polar plates, which could not have been from a new chemical arrangement of the liquid matter, and, as the water the only ingredient actually decomposed, the fluid must enter into the composition of it together with oxygen and hydrogen; which view receives much support from the fact that water is formed on the combustion of these gases by the electric spark.

A difficulty however arises on this point, for those gases may be exploded, and the fluid rendered visible whilst effecting the decomposition of air, and the union of the oxygen obtained from it with the hydrogen of the burning body; and in proof of this theory advances the facts, that in all the various methods adopted to obtain fire, it is generated by electric excitation (except when obtained by the combustion of a burning glass) and in damp weather, when the atmosphere is deprived of the electric fluid, held in suspension by it at other times to a very considerable extent. fires and lights burn very dull.

In further support of this theory he offers the following explanation of the ingeneous experiments of Messrs. Tyllock, Gann, and Mackrell on the ignition of metals in acid solutions. It may be well to premise that the acid solution through which the electric currents were passed was composed of one part sulphuric acid and ten parts distilled water, in a common drinking-glass that held about a pint.

1. Experiment 1. Fine iron wires (No. 26) were attached to the terminal wires of the battery. The positive wire was first immersed in the solution, and the circuit was completed by the immersion of the negative wire. The latter burned with a beautiful reddish flame. This would seem to result from the decomposition of the hydrogen, which, when 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 oxygen then on the negative electrode, and the released gas combining with the hydrogen and pyrogen, 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 becomes 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 pole of the unconnected piles, rendering the pyrogenic current from first to last minute during its continuation. No flame appeared at the positive pole, there being no hydrogen present, all that obtained having escaped at the negative electrode.

2. 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 completely completed, the positive wire, it became red-hot; an inch and half under the solution, as in the last experiment, and from the same cause; but when it was only brought into contact with the surface of the solution it fused, which was prevented when it was immersed.

3. 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 completely completed by the positive wire, it became red-hot; an inch and half under the solution. This resulted from both oxygen and hydrogen being present at the negative pole, as in the first experiment.

4. 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 positive electrode, no hydrogen was present to produce it. But when the experiment was reversed, and the copper wire placed at the negative termination 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, as before, present that problem.

5. 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 being first immersed, the zinc was heated to a suffusion of the liquid, but the water was placed at the negative, the platinum at the positive, and the latter first immersed, the zinc at the negative burned with a purple flame, hydrogen being present, as before, at that pole.

6. Experiment 6. With platinum at the positive and sulphur of antimony at the negative, the platinum being first
impressed, the antimony or negative electrode fused and inflammation, depositing on the glass and surface of the solution an orange-coloured powder resembling Kernes' mineral. When the sulphur was at the positive, the platinum at the negative and the first mixture of the solution, when further iron was added, were given off by the sulphur, but it was not ignited, for, as in the preceding experiments, there was not any hydrogen at the positive point.

"Experiments. 7. When an iron wire was fixed to the positive, and a charcoal point at the negative, the iron wire being first immersed, immediately the charcoal touched the solution it became very brilliant. But when the experiment was reversed this did not occur; for when chemical charcoal was at the negative hydrogen was present, but not when at the positive." Mr. Lake considers that in these experiments the ignition could only have resulted from the presence of electricity and the power it possesses of causing matter to vary its form; and that they particularly evince its property of ready combination with oxygen and hydrogen and formation of flame.

This discovery will produce an important revolution in chemical science; for if electricity enters into the composition of water it must also be a constituent part of every body into the formation of which water enters. Mr. Lake also asserts that the fluid is a component part of oxides; that, in fact, it is the medium by which the union of oxygen with its bases is brought about, and that it was by its abstraction Sir H. Davy reduced potash, magnesia, and other substances. Mr. Lake also believes that it is a most important ingredient in acids, and that it forms ozone by combining with oxygen. [O'zone, P. C. S.]

"Water," he says, "is the medium by which many chemical substances amalgamate, and the decomposed oxygen of matter produced. Many bodies may be placed together, ground together, and every device adopted to produce chemical action among them in vain; but let only a little water be introduced, and immediately the desired effect is produced; the substances are in part, or entirely, decomposed, and the matter of which they consisted assumes altogether different forms, and acquires different properties.

"Pyrogen acts in a similar manner, and by its abstraction or combination, matter enters into the place. Thus it is found that by discharges of it in common air nitric acid is produced; and when mercury is placed in contact with a solution of ammonia, and negatively electrified,—that is, the pyrogen drawn from it,—it expands in volume and becomes a soft solid. But the presence of pyrogen, which returns to it on breaking communication with the galvanic battery, destroys the affinity between the mercury and ammonia. Therefore, when the product of this experiment is exposed to water, the latter is decomposed by it, giving out hydrogen, whilst the former absorbs oxygen and pyrogen, leaving mercury and a solution of ammonia. If exposed to air this is also decomposed, and oxygen and pyrogen are absorbed.

Potassium, sodium, calcium, barium, strontium, and many other bodies, are obtained by the abstraction of pyrogen from their solutions, which means the affinity between them oxygen is destroyed, and they separate. But, as in the case of the amalgam of mercury and ammonia, and from the same cause, as soon as they are exposed to air or water, they absorb oxygen and pyrogen, and return to oxides.

The chemical affinity of pyrogen and oxygen appears to be less with ammonia than potassium, sodium, calcium, barium, strontium, 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 the experiments of Messrs. Schönhobel and Gnaux with ozone, Mr. Lake deduces that zinc, nitrogen, and hydrogen, to perhaps iron and copper, 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 ozone. 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 acids. 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 other substances which have a greater affinity for the latter.

"When water decomposes ammonia, the oxygen of the amalgam of the bases of ammonia and mercury, there is a most decided decomposition of this acid and formation of carbonaceous matter."

"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 of the igniting solutions in acid solutions. [Ozone, P. C. S.] In a similar manner it may be procured from muriatic, phosphoric, and many other acids.

These views of this subject certainly 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, uniting 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 new, we will not enter into further details; but the above is the substance of what has appeared concerning it.


PYROLA. [WITTK.-GREEN, F. C.] PYXIDIFULCA, an obscure genus of fossil Inversoria. (Ehrenberg.)

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QUADRATURE. Not thinking of this Supplement, we inserted in the article Trisection, P. C., the extension given to the approximate arithmetical quadrature by Mr. Rutherford (Phil. Trans., 1641). 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-GRASS. [Brisa, 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. [Simaruba ces, P. C.]

QUEEN CONSORT. [Queens, 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 wind 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 Bagshot 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.]
QUISICALUS, a genus of birds, allied to strigine. [Stornidea, P. C.]
QUIT-RENT. [Rent, P. C.]

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RADIATA. [RATED OR RADIATED ANIMALS, P. C.]

RADIOLAS (from radiana, little ray, in allusion to the rayed capsules), a genus of plants belonging to the natural order 100, is of 4 species, placed beneath the Family 100, deeply tridif. There are 4 petals, 4 stamens, 4 capsules, with 8 cells and 8 valves.

R. radiata is the only species of this genus. It is the Radiolaria is well known to 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 capsules light brown and slightly depressed; the sepals deeply and acutely 3-angled, connected below into a tube. The seeds of this very small plant should be sown in a moist situation where they may afterwards be scattered to their advantage.

(Balhington, Manual of British Botany; Don, Gardener's Dictionary.)

RAIA, a genus of cardinalline fishes, established by Linnaeus, and since much 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 apertures below. The dorsal fins spring from the tail. The common skate and the ray are familiar examples.

The following are the principal sub-genera into which this genus has been divided:

1. RAIA has been divided into two sub-genera:

   1. RAIA has been divided into two sub-genera:

   a. 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 region between the pectorals, head, and branchia. Fishes of this genus are rare in the British seas, but common on the coasts of Southern Europe.

   b. RAIA. The tail of the typical Ray 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 fleshy-set teeth arranged in quinquelocular rows.

   2. The Sting-rays, which have a slender fan-like 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 RAIA proper.

   3. Myliobatis. Tail very long, armed and bearing a small dorsal fin; head projecting from between the pectorals, which are very broad, and the head and arranged like stones in a pavement. The Whip-ray belongs to this sub-genus.

   4. Cephaloptera. Tail also armed, and bearing a small dorsal fin, but the head is curiously truncated, and is placed between two horn-like processes of the broad pectoral fins, giving the creature a somewhat unprepossessing and incompleat aspect. The teeth are small and very slender.

RAILWAYS. [TRANSIT, RAILWAY, P. C. S.]

RAIMBAULT, 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 from a second-floor window; but his life was saved, partly by the influence of his long clothes, and partly by the fall being broken by some leads below. The girl from whose arms he fell seized with such a panic that she rushed out of the window, and was never heard of by any of the Rainbuchs afterwards.

Raimbach was educated in Archbishop Tenison's library-school, where he was the fellow-pupil of the late Charles Mansion; he was also apprenticed in a shop of 4 years' standing, and was engaged for a long period in the arts, and his father apprenticed him in 1789 to a Hall, the engraver; Sharp and J. Heath had both declined to take him. The first work engraved by the young apprentice was a project upon the anatomy 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 booksellers; but he then devoted himself to painting with great assiduity 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 and portrait painter, and he prospered in a short period so well in both, that he was under inofficious 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 sitters 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 executed all his great works; the house was given to him by his wife, 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 most intimate friend. In 1812 he became Wilkie's engraver, supplanting Burnet, who had already engraved some of Wilkie's pictures in an admirable manner. The chief reason of Wilkie's breaking with Burnet appears to have been what he considered the smallness of his interest 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 arrangement; 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 auction for fourteen or fifteen pounds. The first print was published in 1816; after which Wilkie and Raimbach made a tour together in the Netherlands. The rest appeared in the following order: 'The Cut Finger,' 'The Errand-Boy,' 'The blindman's Run,' 'The Winning of the Child,' 'The 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 terms 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. Secured by Cousin's admirable mezzotinto from it, there followed a rush in the track thus so auspiciously commenced, and the new lights (as in Alahdin's lamp) were preferred to the old. Raimbach an assistant, 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 that of being held in the highest estimation 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 the late Mr. Jean-Philippe Rameau, a very celebrated musician, equally distinguished by his compositions and by his art.
numerous writings on the science, was born at Dijon, in 1683. It may be presumed that he inherited a taste for music, for his father was so passionately fond of the art that he had his son educated at a very early age for the church profession, and obtained the organist's chair in the Sainte-Chapelle of the above-named city. He taught his children to play from notes before they could read from letters, and the success and rapid advance of his pupils, as 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 at college, where his knowledge was 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 set out for Italy, in order to complete his knowledge of 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 his 'Traité de l'Harmonie'; but not finding the taste for church music in proportion to his spirit in that town, he proceeded to the capital of France, where in 1722 he published his great work, and finally fixed himself. He was soon appointed organist of Sainte Croix de la Brestanerie, and in a very short time in writing numerous theoretical works, in compounding his harpsichord lessons, and in teaching. He did not distinguish himself in that line in which he was destined to excel till the year 1735, when, at fifty years of age, he published 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 Lulli (LOLL, P.C.) and Rameau, similar to that which in after times was caused by Gluck and Piccinni. [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 the music; but its performance was prohibited under the pretext that it was prostituted a sacred subject.

Of the many operas by Rameau, his 'Castor et Pollux,' produced at the Académie Royale de Musique in 1767, is the best known. Great success attended it; there were parts desired elsewhere, and it must always excite the admiration of true connoisseurs. A chorus in this, of Spartacus, 'Que tout genieus,' has but few rivals, in either ancient or modern theatrical music. Even M. Grimm, in his 'Histoire de la Musique,' gives it as an example of the merit of this composition. His 'Durandus,' his 'Zoroaster,' and other pieces, were equally successful. From 1738 to 1750 he produced twenty-one operas and ballets, 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 for him 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 city of Dijon, by act of its council and at the expense of its folly, 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.

But passed his thirty-sixth year he commenced the employment in best known by his large and laboured work on the basso fondamentale, which he and his associates treat as a discovery. [Fundamental Bass, P. C.] But under other names the inversions of the perfect chord, or triads, became known long before, as far as relates to the invention of the basso continuo, the lowest part being called basso, or sonus fundamentales; and afterwards remarks that among the three sources from which rose the triode Harmonic, the lowest was called basses, or sonus fundamentales. But our limits do not allow us to go further into a subject which, to explain clearly, would fill many pages with arguments and examples. It is well considered by Dr. Burney, in his 'History of Music,' and by the same in Rees's 'Cyclopedia.' Rameau's style of writing is not remarkable for perspicuity. This was felt and acknowledged by his most zealous partisan, D'Alembert, who placed the first edition of his 'Principes de l'Harmonie,' 1742, in his produce, but was in the second edition, 1756, a great improvement. In the third, 1764, D'Alembert's work was introduced. In later editions the article has been omitted, and a much better one substituted. [Biographie Universelle; De Laborde, tome iii; Burney, vol. iv.]

RAMENGHI, BARTOLOMEO, called L. BAGNACAVALLO, from the place of his birth, Bagnacavallo, on the road from Ravenna to Lugo, where he was born in 1684. He was a pupil of Raphael, and 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 character 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, Bagnacavallo acquired more of the peculiar grace of Raphael's style, especially in his infants, and his works were much studied by the followers of Raphael. He made several copies of the works by Bagnacavallo in San Michele in Bosco, San Martino, Santa Maria Maggiore, and Sant' Agostino agli Sco- pettini, in Bologna. He died in Bologna in 1642, according to Scclari. He was a son of Bagnacavallo, who assisted Vasari in Rome, and Primitico at Fontainebleau, was the son of Bartolomeo Ramenghi.

(Berufflingli, Le Vite de' più insigni Pittori e Scultori Ferrare, this excellent work by Lanzi 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 Pittori, &c.)

RAMMohan Roy was born about 1774, in the district of Burman, in Bengal, Hindustan. 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. Rammohan 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 acquire the Sanscrit.

Rammohan 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. When about the age of sixteen, he wrote a manuscript called 'The Idealisation of the Vedas,' a work which, if not a manuscript containing the realisation of the idealism of the Ilius, this, together with my own sentiments on that subject, having produced a coolness between me and my immediate kindred, I proceeded on my travels, and passed through various countries, chiefly in Europe, but some beyond the limits of Hindustan. 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 pernicious practices, revived and increased their animosity against me; and my father, against the wishes of his family, left me again obliged to withdraw my countenance openly, though his limited pecuniary support was still continued to me.' His father died in 1803, and he then published various books a vindication of his conduct against the arm of 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 tenets of Hindustan are long before the others 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 prosecution 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 antient abstract called the 'Vedant, or the Resolution of all the Vedas,' written in Sanscrit.
Rammohun Roy translated it into Bengalee and Hindustanee; and afterwards published an abridgment of it for gratuitous circulation. Of this abridgment he prepared an English translation in 1816, the title of which states that the 'Vedant is the most celebrated and revered work of Brahminical theology, establishing the unity of the Supreme Being, and the law of propagation of the universe,' and that the movements of the defendants and the conveyance of the ammunition. The exterior and interior sides of the rampart are formed with sloping faces of earth raised in different degrees with that of the horizon: or they are retained by revetments of brick or stone, nearly upright, the exterior face of the rampart constituting the escarp of the ditch in front. The rampart is a flat place, this is divided into its length, into 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 30 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 parapets.

The terreplein and the interior slope of a rampart, as well as the surface of the parapet, are 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 assault, and the parapet broken down 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 stationed at the parapet, destroying the enemy's retiring in 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 height of the parapet 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 34 feet above the terreplein of the rampart; and, because the artillery and the gunners are to be protected by the parapet, if 7 feet be added to the height of the terreplein of the rampart above the ground, the sum will be the required height of the crest of the parapet.

RAMPOUR, a town of Hindustan, in the district of Bara, province of Bengalee, and presidency of the N. Bengal, on the east bank of the Goolia 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 Fyzool Khan, a Rohilla chief to whom it had been secured by the peace of Lallading 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 Oude 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 Rampoor, together with a small territory.

Rampoor is chiefly remarkable for the curious kind of fortification by which it is defended. A high thick hedge of bamboos faced on the outside by a prickly underwood of cactus and balsam. The entrances are by narrow passages, defended by strong wooden barriers. It is said to be an extremely effectual system against infantry, as neither cavalry nor infantry can be brought to act against an enemy whom they cannot see, and who is hiding from them among the close stems of the bamboos, and under cover of the almost impenetrable barriers. The town was almost totally destroyed in the summer of 1824, upon the retirement of the troops in the province. [Hamiton's 'East India Gazetteer'; Hieber's Narrative of a Journey through the Upper Provinces of India (1824 and 1825).]

Ramsay, Andrew Michael, generally known as the Chevalier Ramsay, was born at Ayr, in Scotland, the year 1686. He was educated at Edinburgh, where
chiby 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 Wemyss, at the University of St. Andrew's. Having entered into society among the teetotals of the Protestant faith, he went to Holland for the purpose of visiting a Protestant divine of the name of Poiret, who had obtained a certain celebrity as one of the leaders of the Quietist party. We are informed, in a recent controversy, of 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 leaving France, and in 1749, he was exiled to the same, and was thus freed from the necessity of renouncing his faith. He went to London, where he was received into the society of the physician and political writer, the late Samuel Hume, who was his landlord, and whose house, afterwards, at 17, Millbank, was the birth-place of his son Ramsay, the well-known politician. He resided in London, with some of his disciples, and, at the end of the reign of the elder George, and the beginning of that of the younger, he returned to France, and was received into the number of the greatest courtiers. He remained there, however, only a short time, 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 labour. On visiting England, he obtained, through the influence of Dr. King, the degree of doctor of civil law in the University of Oxford. He was also admitted a member of the Royal Society of London. After his return to France he was appointed intendant to the town of Turenne, where he afterwards became Duke of Bouillon; he held this situation till the year 1741.

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 principles of the church he had adopted, is open to considerable doubt. His reputation as a historian is chiefly founded on a religious reputation that he did not live to publish some philosophical works which he was preparing, such as his answer to Spinosus, and a treatise on the Progress of Human Understanding, in which, says a writer of that time, he intended to divide the world into several sects that would be said to him, and to separate him from all his own in his own. (Spence's Anecdotes, p. 84.) The work which he best known, is his Voyages de Cyrus, an account of the travels of a Frenchman, but, according to Vautier, a very feeble one. The character of Zara gave considerable offence to the Princess of Conti, one of the most esteemed 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, P. C.] it was at the same time mistaken for an imposture respecting his 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 vol. 8vo. The work, however, for which posterity is most indebted to him is that entitled 'L'Histoire de la Vie de Francois de Salignac de la Motte Fenelon.' Hugues, 1728; published also in London the same year. His great intimacy with Fenelon has made it as visible and received many interesting facts of his private life, and it contains a valuable record of his opinions. His other published writings are 1°, 'Discours sur le Poéme Etoile,' originally forming the preface of his edication of that poem, 1727, 8vo. 2°, 'Essai de Politique,' 1730; it was afterwards reprinted under the title 'Essai de Politique.' 3°, 'Histoire de Turenne.' Paris, 1734, 3 vols. in 8vo. and 4 vols. 12mo. With some affection 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 Psychométrie, ou Réflexions sur les différentes Caractères de l'Esprit,' par un Mylord Anglais.' A posthumous work published at Glasgow, 1749, 4 vol. 12mo., in English, entitled 'Philosophical Principles of Natural and Revealed Religion explained and unfolded in a Geometrical Order.'

(Dictionnaire Historique, 4 vols., Amsterdam, 1763; Dictionnaire Historique et Chronologique, Paris, 1735; Steele's Dictionaries of Books and Men, London, 1826. The details of his conversion to the Roman Church will be found in the life of Fénélon by le Père Querebeuf, appended to his edition of his works."

RAMSAY, ALLAN, an eminent portrait painter in his time, and the son of Allan Ramsay the poet, was born in 1713, in Edinburgh, the birth-place of his father also; the circumstances is alluded to by Churchill, in his satire of the "Prophecy of Famine."

'Then came the Ramsays, men of worthy note, 
Of one particular; as the other whores.

'And Ramsay,' says Edwards, 'may be called self-taught; but he studied a short time in Italy with Solimena, and F. Bernardi, called Imperialis. After practising a short time in England, he settled in London, where he was introduced by Lord Boile to George III. when Prince of Wales. He painted two portraits of the Prince, which were engraved, one by Ryland, and the other by Wollcot. At the death of Mr. Shelburne, in 1767, Ramsay succeeded to the place of painter to the king; he retained the place until his death, when he was succeeded by Sir Joshua Reynolds. He died at Dover in 1784, on his return from a visit to Rome; he had already been a pensioner at the Academy of St. Luke. He 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, '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 married twice: his second 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.

(Edward's, Anecdotes of Painters; Cunningham, Lives of the British Painters, &c.)

RANDIA (nominated after Isaac Rand, M.D., once a demonstrator of botany at the Chelsea botanic gardens), a genus of plants belonging to the natural order

R. digitata, Bog-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, mostly two-celled. The calyx has about six teeth, rather smaller than the villous corolla. 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 into water, causes a great atonement or even kills fish, having the same effect as the Coccus indica, which is not, however, known in the East Indies, where this plant grows. In the form of powder it is a powerful emetic. An infusion of the bark of the root is employed to nauseate in bowel complaints.

R. wilsoniana, 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 British Isles, and in this it resembles the last plant. The flowers are large, white, and fragrant, and in two or three at the top of the branches. The berry is about the size of a pullet's egg, ash-coloured or olive-grey, and 2-celled. The seeds are small, brown, pointed, and winged. 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 39 species of Randia, none of which, however, are applied to the true Randia. The flowers of these species render it deserving of a conspicuous place in the hothouse. The uncommon appearance of this plant is also in its favour. There are 39 species of Randia, none of which, however, are applied to the true Randia. The flowers of these species render it deserving of a conspicuous place in the hothouse.
RANGONE, 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 learned. Count Nicolò Rangone, who lived in the latter part of the 13th century, was the father of eight sons and two daughters, whom he caused to be instructed with great care, and all of whom became distinguished for their love of science and literature. The learned Visdomini, who was preceptor to several of them, has left an interesting memorial of the care bestowed on their education in his Dialogues entitled 'Antoni Marie Visdomini de Ocio et Sybillis.' One of his pupils, Count Guido Rangone, figured as a distinguished gentleman in the learned service of the court of King Francis I. Filélio, in his book 'de Optima Hominum Felicitate,' which he addressed to Count Guido, enumerates the feats 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 Ercole Rangone, who died young during the pillage of Rome in 1527, is likewise extolled for his love of learning by Giglio Giraldì, and also by Vida in his second book 'de Arte Poetica.'

Curtius Rangone, a historian, took 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 del Vasto. Governor of Modena in 1528, he was closely connected with Benedello, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment. Ginerva Rangone, sister of Costanza, married first a nobleman of the Correggio family, and then, in the 17th century, together with Count Brugnoni and Benedicto, the celebrated novelist, who wrote many of his tales for her entertainment.

(A. Famiglia celebri Italiana; Triboschi, Storia della Letteratura Italiana; Memorie intorno alla Vita del Marchese Gerhardo Rangone, Modena, 1816.)

RANULCULUS (from rana, a frog, because many of the species inhabit humid places frequented by that reptile), a genus of plants, the type of the natural order Ranunculales. It has 5 sepals, occasionally 10, with a nectariferous excurrent acorn; its ovary is hemispherical, and the axis is slightly straight, the achenia ovate, somewhat compressed, mucronate, arranged on globose or cylindrical receptacles. The species are mostly annual, and if applied when fresh to the skin will produce blisters; this quality is destroyed by drying or by heat.

A. aquatilis, Water-Crowfoot, has a floating stem and submerged leaves divided into numerous capillary segments spreading on all sides. The floating leaves are reniform, from 3- to 6-parted, the lobes wedge-shaped, toothed at the top, the petal obovate, larger than the calyx, the flowers white. It is native throughout Europe, Western Asia, North Africa, and also in America and England, in pools and stagnant waters. It is the Baradak vrifying of Dioscorides, 2, 206. Sometimes it produces very large flowers, and makes a handsome show in ponds and ditches; the curious variety in the flower, the leaves thinner and more nearly round, is greatly prized for its beauty. Dr. Pulteney contradicts the assertion of its deleterious qualities, and says that it is not merely harmless but nutritious to cattle, and tells us that on the borders of the Avon it is said to be carried 3 miles in a cart. A plant entirely new to England is the Linnæus, as used in gardens, the same species which, under the name of Scrophula elata, is used in the treatment of many diseases in Sweden. A notion that the root is efficacious in the cure of piles gives it its common English name. We usually find the flower closed from five to nine in the evening, and in wet weather. It is the χλευδον of Theophrastus, Hist. Plant, 7, 14, and the χλευδον μερυ of Dioscorides, 2, 212, and of Pliny, Hist. Nat. 258.

A.acamptus, Curly-Crowfoot, has a fibrous root, the radical leaves 3-cleft, dentate, the stem-leaves once or twice ternate, with linear lanceolate segments, the calyx exerto-petal, the carpels margined, beaked, and spinous; the flowers are pale yellow. It is more hardy than the Burdocks, and is found in England and Great Britain. It is very acrid and dangerous to cattle, though they are said to eat it greedily.

M. Broughon, 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 Turin, which first led to an investigation of the matter.

A. bulbosus, like other of the genus, is extremely acrid, and raises blisters and produces extensive inflammation of the skin. Gilibert states that it vesicates with less pain than cantharides and without affecting the urinary passages.

A. aestivalis, common Garden Ranunculus, has ternate or 3-lobed leaves which are rounded and have serrate margins. The flowers are usually yellow, occasionally white, and are accompanied by a yellow sepal. The fruit is a capsule containing numerous seeds. The plant is commonly found in damp meadows, fields, and along roadsides. It is sometimes used in traditional medicine for its astringent and anti-inflammatory properties.
riternate leaves, the segments toothed or deeply trifid, the stem erect, simple, or branched at the base, the calyx spreading, afterwards reflexed, the spikes of the carpels cylindrical. It is a native of the Levant, and is referred to by Dioscorides, 2. 36. The three species in our gardens have been described, which some have regarded as species:—1. R. a. vulgaris, with the stem branched at the nodes, the leaves ternate, the segments trifid, cut, acute. The flowers of this variety are generally formed double, and have all colours except blue. It is called the Persian Ranunculus. 2. R. a. sanguineus, with a simple stem, ternate leaves, the segments similar, or the lower are cut, the upper are oval or yellow. This is called the Turkey Ranunculus. 3. R. a. tenuifolius, with a somewhat branched stem, and multilab 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. Maddock, 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 principal effect. The petals should have rounded edges, their colours dark, clear, rich, or brilliant, either of one colour or variously diversified on en, white, sulphur or fire-coloured ground, or else regularly striped, striped horizontally (Linn., Don.) or vertically. The cultivation of 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. The roots are divided into roots, which may either be planted in November or March. The former is the best time, but the roots should then be mixed. 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. lanuginosa of Linnaeus is the *bárapasِ fíus* of Dioscorides, loc. cit. The R. muricatus, Linn. is the *bráarpasِ fíros* of Dioscorides, loc. cit.

(Deo, Gardener's Dictionary; Lindley, Flora Medicea; Fras, Synopsis Flora Classica Plantarum; Burnett, Outlines of Botany.)

RAPHIOUSAIUS, *e* genus of fossil Reptiles from the lower Carboniferous strata of the British islands.

RAPE. [Rape, P. C.: LAW, CRIMINAL, P. C. S.]

RAK, RASMUS CHRISTIAN, one of the most distinguished linguists of modern times, was born on the 2nd of November, 1765, in the island 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. He was first engaged with the divinity, and 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 northern history and literature. His great abilities in this branch of learning led him very soon to turn his attention 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, to go to Russia, whence he proceeded in 1819 to Persia. He made some stay at Teheran, Persepolis, and Shiraz, 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 113 ancient and rare oriental manuscripts, among which those in the Pali language were the most valuable. Soon after his return to Copenhagen, he was invited to the chair of languages in 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 should make any progress in the study of the ancient languages of the northern antiquities, and he took an active part in the management and editorial of the journals of these societies. At the same time he was engaged in the preparation of an Armenian dictionary, an Italian, Low German, and Russian Grammar. In 1829 he was appointed professor of oriental languages and chief librarian of the university library. Henceforth his researches were concerning the也不错 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 unrivalled. 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, Stockholm, 1817, one of his best works, has been translated into German and English; 3. Investigations concerning the Origin of the Indo-European Languages, the annual report (Owen.) Copenhagen, 1814; 4. An edition of Bjorn Halderson's Icelandic Dictionary, Copenhagen, 1814; 5. A Spanish Grammar, Copenhagen, 1824; 6. A Friesian Grammar, Copenhagen, 1825; 7. An attempt to introduce the six principal languages of the Dutch 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 ideas. 8. On the age end authenticity of the Zend a Vesta, Copenhagen, 1835, was translated into German by F. von der Hagen, Berlin, 1836; 9. A small Grammar and Vocabulary of the Aera 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 'Verzeichniss' there is one on 'Die Thrakische Sprachklasse,' which is of great importance and interest. Comparative philology is greatly indebted to Rask, for he was the first who pointed out the connection between the ancient northern languages on the one hand, and of the Lithuanian, Slavonic, Greek, and Latin on the other hand. (Zeitschr. der Zeit, third Series, No. xxxvii.)

RATIO, COMPOSITION OF. To the few words which are used to express this notion in Euclid, he 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 correct understanding of it depends the whole of the developments which follow. In incomensurables which the fifth book gives is real 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 in the present instance, we shall begin with the consideration of what we may call Euclid's General Scheme of Euclid, nor Playfair's Euclid—but in Euclid of Alexandria.

There is nothing on ratio compounded (επαρθμενος) of ratios in the fifth book; the word translated composition (συστάσις) 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 same notations. These definitions are as follows:—if A, B, C, D, &c., be in continued proportion, so that as A to B, B to C, C to D, &c., so on, then the ratio of A to C is called the duplicate ratio of that of A to B. The ratio of A to D is called the triplicate 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 said:—"Equiangular parallelograms have to one another the composition of the sides." There is no definition at least, it
It is true that there is found in a great preponderance of manuscripts a passage and its corresponding ratio. It is among the definitions of the sixth book, and literally translated is as follows:—"A ratio is said to be compounded of ratios, when the \( \frac{p}{q} \) of the ratios multiplied together make a certain [ratio]." On the word left untranslated (which, we believe, must be translated by quantitativitie), we refer to Ratio, P. C. This definition is admitted into the editions of Basle and Oxford, and into Briggs' edition of the six books. Peyrard 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 as a disputable passage. Set a scholar to make the text 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 elements. Set a geometrical reasoner to settle the question, with the idea that he must be either deceived by the rest of the book, and there is as little doubt that it would be rejected. The meaning of the passage is, apparently, that if two ratios be expressed numerically as those of \( a \) to \( b \) and \( c \) to \( d \), the ratio compounded of those ratios is to be the ratio of \( 7x6 \times 4x11 \); or possibly, that, expressing the above ratios as those of \( \frac{7}{4} \) to \( 1 \) and \( \frac{6}{1} \) to \( 1 \), the compounded ratio is that of \( \frac{c}{d} \times \frac{a}{b} \) to \( 1 \).

In the early translations from the Arabic, the definition is omitted, and reference is made in demonstrating vi. 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 \( a \) is \( \frac{h}{g} \) from those of \( f \) to \( g \) and \( a \) 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 he fully agrees with him. It is to be found in the Basle 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 jamnepatellis instead of quantitates as the translation. See his discussion of this point at length in his English Algebra (1844), 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 Savile, who (Propsect. in Eucl.) had considered it as a great defect. To the text of Euclid we have only further to say, that this consent of Savile, Wallis, and Gregory, as to the genuineness of the definition in question, is of great weight. But with regard to the matter of the definition we agree entire, in think that the word valueless needs definition to 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 an addition of two integers, and a division of the resulting fraction. An old scholiast on Euclid (cited from Daseypodius by Meibomius and Wallis) is of opinion that \( \frac{a}{b} \) is used rather than the more modern \( \frac{a}{b} \). It is possible that it may be understood in a wider sense, so as to include fractional and incommensurable ratios. That is, as Wallis ex-

presses it, how-much-fold-as need instead of how-many-fold, that much may suggest the idea of a part of a time (commensurable or not) which 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 numerically expressed, so as 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 Etosticus, in his commentary on book ii. prop. 5 (of Torelli, 4 of the preceding editors). He here cites, expressly from the elements, the definition as given; and adds, as the explanation of it, that, by multiplication, turns the consequent into the antecedent. This number, be says, gives name to the ratio, and he cites Nicomachus and Heron 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 supposition, must be assigned to be wanted in the elements. The notion of a ratio is easily and almost necessarily connected with the idea of alteration in that ratio. We cannot express a ratio without two magnitudes, of which, whether in the ratio given, becomes the second. If we want to alter in the ratio of \( P \) to \( Q \), this is easily done when the quantity to be altered is \( P \); for then the process is only writing \( Q \) instead of \( P \). But if it is \( Q \) that is to be altered, the quantity by the five found, so that \( A \) and \( B \) shall have the same ratio as \( P \) and \( Q \).

If it be a numerical ratio which we consider, say that of \( 3 \) to \( 6 \), alteration of any number in that ratio implies that we change all its terms by the same factor, and alter the ratio of three into the same fraction of five. Alteration of any magnitude, say \( a \) length, in that ratio implies that, choosing any length as a measure, we alter every three such lengths which the given magnitude contains into five, and every fraction of three into the same fraction of five. This amounts to changing the number or magnitude into five-thirds of what it was, and generally, alteration in the ratio of \( a \) to \( b \) (numbers) is nothing but multiplication by \( \frac{a}{b} \).

Take a magnitude \( A \), alter it in the ratio of \( P \) to \( Q \); say that then becomes \( B \), that is \( A \) to \( B \) as \( P \) to \( Q \). Take the magnitude we left off with, \( B \), alter it in the ratio of \( R \) to \( S \), making it \( C \). Take \( C \), alter it in the ratio of \( V \) to \( W \), making it \( D \). Then at three processes, by three successive alterations dictated by three ratios, we have arrived at \( D \), which must have altered \( A \) in the ratio of \( A \) to \( D \). Say that the ratio of \( A \) to \( D \) is simply expressed by that of \( M \) to \( N \). Then, if we begin with \( A \), and alter it at once in the ratio of \( M \) to \( N \), we change it into \( D \), producing the same effect as if we had successively altered in the ratios of \( P \) to \( Q \), \( R \) to \( S \), and \( V \) to \( W \).

Hence the ratio of \( M \) to \( N \) properly is said to be compounded of the ratios of \( P \) to \( Q \), \( R \) to \( S \), and \( V \) to \( W \); it dictates the alteration which will positions at once the effects of the three alterations prescribed by the three other ratios. In like manner, we say in addition, that \( 10 \) is compounded of \( 6 \) and \( 4 \); for addition of \( 10 \) is equivalent to the addition of \( 6 \) and \( 4 \). In multiplication we say that \( 24 \) is compounded of \( 6 \) and \( 4 \). And generally, the compound should be defined as that which produces the united effect of all the components, when both components and compound are used in the same way. Euclid, vi. 23, is now more than a mere addition to the phraseology of geometry. The parallelograms \( ABCD \) and \( EFGH \) [the reader may draw the figure for himself] being equiangular, it tells us, if we take any magnitude and alter it in the ratio of \( AC \) to \( EG \), and then alter the result in the ratio of \( AB \) to \( EF \), the change thus made at two steps might be made in one by altering the original magnitude in the ratio of the area \( ABCD \) to the area \( EFGH \).

This process applies equally to commensurable and incommensurable ratios; but in the former case of course the arithmetical substitute for composition of ratios is easy. We want to compound the ratios of \( a \) to \( m \) and of \( a \) to \( b \), all four

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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 $n$-raths of $P$. After this in the ratio of $a$ to $b$: it becomes $a$-raths of $mb$-raths of $P$ which would also be obtained by altering $P$ in the ratio of $ax$ to $bxm$. Hence composition of numerical ratios is performed by multiplication of the antecedents for an antecedent, and of the consequents for a consequent. The process then is merely equivalent to that of the multiplication of fractions.

If $\frac{a}{m}$ and $\frac{b}{n}$ were called the quotants (quotantia) of the ratios, then the quotancy of the compound ratio is the product of the quotants of the components, as in the definition (be it Euclid's or no) which is found in the manuscripts of the elements.

Duplicate ratio ($\frac{a \times a}{m \times m}$) has been defined by Euclid in the manner hereinafter 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 $P$. 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 compounded of $Q$, $R$; and our two steps, or alterations, are an addition in the ratio of $P$ to $Q$: hence Euclid's duplicate ratio is the ratio compounded of two equal ratios; and, similarly, triplicate ratio ($\frac{a \times a \times a}{m \times m \times m}$) is that compounded of three equal ratios.

The subduplicate, subtriplicate, sesquiplicate, &c. ratios, which later geometers used, completed that language of multiplication and division applied to operations of powers and roots which Euclid laid the foundation of, and suggested the idea of logarithms. [See also Addition of Ratios, P. C. 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 more involved discussion 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 and the manuscripts in Bryant); and Bryant admits it accordingly. 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 laid down. Robert Simson omits this lemma, and so leaves the proposition underspecified. 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:

\[ A \times B \]
\[ A \times Y \]

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 less than that of $Y$ to $B$; and therefore $Y$ is less than $X$; 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. Clear 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 that $P$ to $Q$ is the ratio of $A$ to $B$; and $C$ to $D$; we wish to return back again to the ratio of $A$ to $B$. We must compound the ratio of $P$ to $Q$ 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 belong 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 ancient writer’ had provided a scheme which supposed 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 commonest propositions of algebra into geometrical language (and what else could have been meant it is hard to imagine) the algebraical equivalents should have been introduced. Take the proposition $K$, for instance, which it may safely be asserted no beginner ever fathomed. The following is an arithmetical case of it.

If \[ \frac{a}{c} + \frac{e}{d} \]
\[ \frac{b}{d} \]
\[ \frac{f}{a} \times \frac{k}{m} \]

And \[ \frac{a}{c} \]
\[ \frac{b}{d} \]
\[ \frac{f}{a} \]

Then \[ \frac{e}{d} \]
\[ \frac{k}{m} \]

REAMURICACEAE, a natural order of plants belonging to the Exogenous class. It has a 5-parted calyx, surrounded externally by imbricated bracts; 5 petals, hypogynous, unequal-sided, 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; 2-4-5 carpels, partially separate from each other, surrounding a central placenta which passes into the base of each; or 2 or 4 ascending antapetalous ovules, with filiform or sulcate styles; a capsule fruit with 2 to 8 valves and as many seeds as it is. It is diminished by abortion; shaggy definite erect seeds, with a straight embryo surrounded by a small quantity of nearly albumen, and the radicle next the hilum. The species of this order are small shrubs, with compound leaves alternately, and have no stipules, and are overgrown by resinous suck girdles.

This little order consists of three genera, Reamuria, Holoschua, and Eichwaldia, which were formerly united under the name of Tamariscceae; 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 north Africa, and of salt plains in the milder parts of northern Asia.

The genus Reamuria was named by Hassequist in honour of René Jean Baptiste Reamur. [Reaumur, P. C. C.]

It has a 6-parted involucrated calyx; 5 petals, persistent, furnished at the base on each side with a ciliate appendage; numerous pentadelphous stamens; 5-6 stigmas; a 5-valved 5-celled capsule, with valves easily separating from the septa, and shaggy seeds.

R. verniculata has subulate semiterete imbricated leaves, crowded on the branches. It is a native of Sicily, Bormla, and Egypt. This plant resembles Salsola fruticosa. It is used at Alexandria as a remedy for the itch, being bruised and applied externally, and a decoction taken internally.

R. hypericoides has lanceolate flat rather remote leaves. It is a native of Algeria and Persia; these plants 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 sand under a glass-house.

Holoschua, or "black thistle," and $\frac{a \times a \times a}{m \times m \times m}$, "wool," or "thick hair") has a 4-6 parted calyx; 4-5 petals; 8-10 hypogynous monadelphous stamens inserted into an hypogynous gland; 2-4 short sulcate styles; the capsule 3-4 angled, 2-4 valved, 2-4 celled; the seeds few, large, surface shaggy. The only species is H. Songarinia, found by Ehrenberg in the Soongarian desert of Siberia. In cultivation this plant requires to be watered with salt water. All the plants of this order abound in saline matter in their tissues.

(Lindley, Vegetable Kingdom; Don, Gardener's Dictionary; Lindley, Flora Medic.)

REBE is the old English word for Discount [P. C. 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 centage from the sum. Thus, if a sum be due a year hence, say 100L, discounting at five per cent. means paying 95L now in lieu of 100L a year hence. There are one or two old difficulties connected with discount, which we intended, as we thought, to notice under borrowings. 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 to adopt propositions which supposed some of the numbers 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 overdued.
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 300l. more in seven years. The first rule that was given looks, 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 100l. paid three years after its time. But this, it is said, was 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 interest up to 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 inaptitude 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., of 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. + £261... years' interest) which he received + 1036... years' interest which he makes on the 300l. (the other part not making interest) + the sum which will in 1-036... years yield 300l. (285-19...%.) + the interest on this. That is, 420l. altogether, of which 200l. 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 most 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 year and B at the end of 8 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

\[ A + B = A(1+r)^x + B \left(\frac{1}{1+r}\right)^x \]

and the receiver of the above sum, in years after its receipt, or x + m years from the present time, will have \( (A+B) \)

\[(1+r)^x \]

which is

\[ A(1+r)^x + B \]

Or

\[ A(1+r)^{x+m} + B(1+r)^{x+m} \]

And this is precisely what he would have had from the payments themselves. And the accumulations or present value of the equated sum are 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 a rule is consequentlie said to be false which is, upon its given hypothesis, perfectly true. The value of an interminable annuity, calculated at simple interest, comes out infinitely great; or no sum is large enough to pay t. Now it is clear that 50l. will pay an annuity of 1l. a year at five per cent. for ever. And this may 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

\[ \left(1+r\right)^{-1} + \left(1+2r\right)^{-1} + \left(1+3r\right)^{-1} \]

At the end of a year, this becomes

\[ 1 + \frac{1}{1+r} + \frac{1}{1+2r} + \frac{1}{1+3r} \]

The first term is partly principal, partly interest: and the remainder of annuity has become due. But the manner in which the rule was framed does not allow us to pay away the \( r(1+2r)^{-1} \) and \( r(1+3r)^{-1} \), which are never to make interest again, in part of the first year's annuity, but requires that the 1l. part of which will make interest, should all be paid so. 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, 3-79079l. A year's interest is 38956/111.; let this all be 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 3-79079l. 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>Pay 90009</td>
<td>+ 09001 = 1</td>
</tr>
<tr>
<td>2-9932</td>
<td>09835</td>
</tr>
<tr>
<td>Pay -38333</td>
<td>-16667 = 2</td>
</tr>
<tr>
<td>2-14019</td>
<td>-43003</td>
</tr>
<tr>
<td>Pay -76923</td>
<td>+ 23077 = 2</td>
</tr>
<tr>
<td>1-38096</td>
<td>-41428</td>
</tr>
<tr>
<td>Pay -71492</td>
<td>-28571 = 2</td>
</tr>
<tr>
<td>2-6667</td>
<td>2667</td>
</tr>
<tr>
<td>Pay -66667</td>
<td>+ 33333 = 2</td>
</tr>
<tr>
<td>+0000</td>
<td>-00001</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>3-89261</td>
<td>-8926</td>
</tr>
<tr>
<td>3-26160 after paying £1.</td>
<td>26160</td>
</tr>
<tr>
<td>2-6106</td>
<td>do. do.</td>
</tr>
<tr>
<td>-90101</td>
<td>-90101</td>
</tr>
<tr>
<td>1-87107</td>
<td>do. do.</td>
</tr>
<tr>
<td>1711</td>
<td>1711</td>
</tr>
<tr>
<td>-10582</td>
<td>do. do.</td>
</tr>
<tr>
<td>-16400</td>
<td>do. do.</td>
</tr>
</tbody>
</table>

So 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.

RECEPTACULITES, a genus of fossils proposed by Dranacre, synonymous with Eudioxidus of Murcichon.
REF
472
REG

RECORD. [Readings, P. C.]

# Refining is a process applied to various processes in the useful arts, and especially in metallurgy, whereby the substances acted upon are purified by the chemical separation of dross and impurities, and of such foreign matters as may be in communication with them. The refining of metals generally is treated of under Amelioration, 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. 31; and Tin, P. C., p. 472. Some writers apply the name of refining to the preparation of cast-steel, noticed under Steaks, P. C., p. 3; a process which is certainly analogous, in many respects, to the preparation of metals generally. This term is applied to the purification of sugar, of which process an account is given under Sugar, P. C., p. 231.

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 Selsey 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 weather, and also 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.' This was a 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 1848, recommended the formation of refuges in the British 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 a body of scientific and experienced officers whose recommendations 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, appointed a commission of ten persons, comprising ex-service and military officers and civil engineers to inquire into the most eligible situations for a Harbour or Harbour 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 Harbour of Refuge for the safety and convenience of vessels navigating the Channel; 2. That, in times of war, such harbours might become stations for ships of war; 3. The extent of cost of construction and maintenance; and the advantages likely to result from such works. The Commissioners express their unanimous conviction that additional means are required to the coast of England as 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-eastern coast in a few hours.

The following harbours and positions were especially examined:—Plymouth, near the North Arm; Ramsgate, the Brake, or Small Downs; Dover; Dungeness; Beachy Head, Eastbourne, and Seaford; Newhaven; Portland and Weymouth; Harwich Harbour. Of these places four are selected, viz.:—Seaford, Portland, Ramsgate, and Dover, which the Commissioners estimate the expense required for the construction of the works which they recommend as follows:—Dover, 2,500,000l.; Seaford, 1,250,000l.; Portland, 500,000l.; Ramsgate, 125,000l. The Thames is a large part of the island facing the bay is crown property, and contains abundance of stone: the holding-ground is exceedingly good, and the island has abundance of water for the supply of ships. This would afford great naval 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 Orford, is situated 30 miles from the holding-ground over an extent capable of containing many hundred ships. By the construction of a breakwater and dredging to get rid of certain shoals, 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 breakwater themselves, supported by defences on the shore flanking the approaches to the breakwaters and harbours.

At the end of the Report, W. Symonds, Surveyor of the Navy, says, 'I dissent 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 say that they never go to sea without their bowls of wool. As to 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 were at anchor in the same bay when the Frenchflt on Channel arrival there. As however it has not the advantage of an inner harbour like Dover, Seaford, and Portland, the commissioners do not recommend any breakwater to be constructed, but to be used as a roadstead for merchant-ships and ships of war. The holding-ground in Dover Bay was tested by Captain Washington in the steam- vessel Blazer of 500 tons burthen and 180 horses. In other words, the Commission recommended that the two breaks and the long shipping will afford a safe anchorage, and the probability of siltage, samples of the water, taken up at different times of tide and different depths, were examined by Mr. Phillips, of the Museum of Economic Geology, as to the quantity of matter held in suspension. The impurity of the sea-water, as compared with the water of the Thames taken up at Brentford, Hammersmith, and Chelsea, was, taking the mean of the experiments on each side, as 16 to 6. The Commissioners recommend further experiments as to the probability of siltage in Dover Bay before anything is determined on.

The Commission of 1840 recommended three places as suitable for Harbours of Refuge—Dover, as first in importance; Beachy Head, second; and Ramsgate, third. (Report of the Commissioners upon 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 VI. (1547) ecclesiastical visitors were sent through the different dioceses in order to enforce various injunctions, and, among other things, that of Cromwell with respect to parish registers. In the beginning of Elizabeth's reign this injunction was repeated, when the clergy were required to make a protestation in which, among other things, they promised to keep the register-book in a proper and regular manner. In 1884 an Act (6 & 7 Wm. III. c. 6) for a general registration of marriages, births, and deaths, was passed, and the first registration took place in the year 1885. In 1888, however, a supplementary Act was passed (9 Wm. IIII. c. 92), entitled 'An Act for preventing frauds and abuses in the charging, collecting, and keeping of the taxes imposed in the several counties, districts, and boroughs, and widows.' The 52 Geo. IIII. c. 146 (28 July, 1819) entitled 'An Act for the better regulating and preserving parish and other registers of births, baptisms, marriages, and
England.' The Annual where each Ministers, Registrars The Name Penalty established Accidental having the two schedules nexed minister, and by persons married, and by two witnesses (31). Certified copies of registers of births and deaths to be sent quarterly, when the registrar-general, under the provisions of the Superintendent-Registrar Act are extended to the Marriage Act. The general registrar-general, under the provisions of the Act are the following:—A general registrar-office is to be provided in London and Westminster (§ 2). Lord Treasurer and Lords Commissioners of his Majesty's Treasury to appoint officers, and certify to the registrar-general that the superintendent-registrar is established, having the powers of supervising the registration of the births and deaths of each district, and certifying to the registrar-general, on payment of the fees prescribed (§ 33). Indexes are to be made at the superintendent-registrar's office, searches allowed, and certified copies given to the officers of the registrar-office, searches allowed, and certified copies given (§ 37). Certified copies given at general registrar-office to be sealed, and shall then be evidence without further proof (§ 38). Ministers, &c., may ask parties married the particulars required to be registered; and wilfully 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 may be corrected, within one month, in the presence of the registrar-general, or the next superintendent-registrar, or the registrar-general, and the errors shall be corrected within the time prescribed (§§ 45 and 46). Registers of baptism and burials may be kept hereafter (§ 49). Registrar-general to furnish notices to guardians of unions, &c., specifying acts required, to be returned to the registrar-general, and which are to be published in conspicuous places of the unions or parishes (§ 90).

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 1886, 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 3000 to 50,000, the Registrar-general left the arrangement of the unions to the guardians, subjecting 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, were annexed to a district already constituted by the registrar-general. In 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 registrar of births and deaths is appointed by the guardian, and is paid by the union, which is divided 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 births and deaths of births at the end of September, 1888, was 2193, of whom 1021 were officers in poor-law unions. At the end of December 1888, the number of superintendents-registrar was 615, of whom 64 were superintendent-registars of temporary districts; at the same period the number of registrars of births 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—

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Births</td>
<td>419,321</td>
</tr>
<tr>
<td>Deaths</td>
<td>393,968</td>
</tr>
<tr>
<td>Marriages</td>
<td>1,118,814</td>
</tr>
</tbody>
</table>

Mr. Finlayson, in an estimate of the number of births, deaths, and marriages, which might require to be registered, the first year, calculated the number of births to be 8,000,565; of deaths at 335,968; and of marriages at 114,947. The approximation as to deaths is remarkable, and not less so the deficiency in the births and in some degree in the marriages. The impression is partly from the opposition of interested persons, partly from the erroneous notions of the ignorant, and partly from...
The register-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 exist in the mode in which the registers 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 exactions are used to impress upon persons giving information of death the importance of producing a certificate of cause of death, in the hand-writing of the medical man who attended the deceased in their last illness.

By the end of 1830 about 350 new register-offices had been built, and the use of temporary offices had been sanctioned in many places. The ordnance-office supplied Iron boxes for holding the register-books of each district. By the end of September, 1838, register-books of births and deaths, and forms for certified copies thereof, had been provided by the registrar-general for 2198 registers of births and deaths; and marriage register-books, and forms for certified copies, had been supplied to 11,094 clergymen of the established church, to 817 registers of marriages, to 90 registering offices of the Society of Friends, and to 36 secretaries of Jewish synagogues. 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-registrar of the district, who transmits, once a quarter, the general certificate 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 register-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—

| Births | 480,540 |
| Deaths | 391,007 |

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:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Births</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1839-40</td>
<td>501,589</td>
<td>350,101</td>
</tr>
<tr>
<td>1840-41</td>
<td>504,543</td>
<td>355,622</td>
</tr>
</tbody>
</table>

The number of births not registered still amounts to some thousands annually, and the registrar-general is of opinion that the registration of births will not be complete until it is ascertained by the father or mother, 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—

<table>
<thead>
<tr>
<th>Year</th>
<th>By special licence</th>
<th>By licence</th>
<th>By registrar's certificate</th>
<th>Form not stated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1841</td>
<td>7</td>
<td>16,792</td>
<td>272</td>
<td>19,079</td>
<td>51971</td>
</tr>
<tr>
<td>1842</td>
<td>9</td>
<td>14,935</td>
<td>250</td>
<td>18,134</td>
<td>51448</td>
</tr>
</tbody>
</table>

In registered places of worship 5932 | 6200 |
In registrar's offices 2064 | 2357 |
Between Jews 60 | 58 |
Between Quakers 118 | 158 |

8125 | 8778 |

In each of the four years from 30th June, 1837, to July 1st, 1841, the marriages celebrated in registered places of worship and in registrar's offices were as under:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Registered Places of Worship</th>
<th>Registrar's Offices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1837-38</td>
<td>2976</td>
<td>1098</td>
</tr>
<tr>
<td>1838-39</td>
<td>4654</td>
<td>1564</td>
</tr>
<tr>
<td>1839-40</td>
<td>5840</td>
<td>2232</td>
</tr>
<tr>
<td>1840-41</td>
<td>5816</td>
<td>2086</td>
</tr>
</tbody>
</table>

The proportion of marriages at registered places of worship and at the registrar's offices has slowly increased, and in 1842 the number of marriages so performed represented a population of 1,160,000. The number of marriages registered in England and Wales for the solemnization of marriages was 2282 on the 30th of June, 1844. They belonged to the following denominations:

<table>
<thead>
<tr>
<th>Denomination</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent or Congregational</td>
<td>903</td>
</tr>
<tr>
<td>Baptists</td>
<td>539</td>
</tr>
<tr>
<td>Methodists (Arminian)</td>
<td>204</td>
</tr>
<tr>
<td>Methodists (Calvinistic)</td>
<td>99</td>
</tr>
<tr>
<td>Roman Catholics</td>
<td>284</td>
</tr>
<tr>
<td>Foreign Churches</td>
<td>8</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>42</td>
</tr>
</tbody>
</table>

A particular paper gives the number of marriages, births, and deaths, registered in 1839, 1840, 1841, and 1842, as follows:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Marriages</th>
<th>Births</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1839</td>
<td>1,160,000</td>
<td>492,574</td>
<td>338,979</td>
</tr>
<tr>
<td>1840</td>
<td>1,193,605</td>
<td>502,303</td>
<td>359,634</td>
</tr>
<tr>
<td>1841</td>
<td>1,196,496</td>
<td>312,518</td>
<td>345,847</td>
</tr>
<tr>
<td>1842</td>
<td>1,305,825</td>
<td>517,739</td>
<td>349,519</td>
</tr>
</tbody>
</table>

REGISTRATION. (Scotland.)

The registration of documents in Scotland is a great and important system intimately connected with the established and connected churches, 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 any such records may stand in the place of the originals when these are not forthcoming, but that a party is not to found an extract if he have the original deed in his possession and can produce it. In the case of sales, however, and other deeds, of which, as will be seen below, it is not the deed itself, but its registration, that makes the complete title, an extract from the register is the proper document to be produced. There is a certain class of actions, however, to which it is necessary that the registration should be producible if it be accessible. These are called Actions of Reduction-Improbation. Such an action is raised against the party favoured by the deed, by some other party, and its object is to annul the conveyance, or, in other words, to declare the whole transaction invalid in law, in 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 conveyance 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 questioned however if the mere registration of such deeds in all cases that complete the transfer of property which is necessary to bar the claims of creditors under the statutes against alienations to their prejudice by insolvents. The registration of ordinary documents for preservation has been authorized by the Act of 1834; but it is generally extends to registration in any authentic public register that is competent. Besides the central register attached to the supreme court, there are others connected with the Sheriff...
and Corporation Courts; but it does not appear to be distinctly settled what may be, with reference to various descriptions of documents in each case, a 'competent' person. By far the most remarkable of the registers for preservation is that of the Saines and Reversions, the former word expressing the Act by which an estate is created or transferred in the latter it is recorded during the life of the person entitled to the extinction of a burden, i.e. of the devolution of a temporary estate on the person entitled to the remainder. This system has been gradually formed. In its present state its unobjectionable principles as regards the subsequent ownership on the register, no latent title derived from the same authority can compete with it, and that registered titles rank according to their priority; so that if A first sets this property to B and subsequently sells 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 pursuance of this system, in 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 (Tassies, P. C. S.), parties can trust that there are no latent rights, and may safely deal with the person who professed 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 transferance of land were bound to return their edicts to the notaries. In effect a system was made to produce regularity in these registers, by penalties. It was by the Act 1617, c. 16, that the system was founded on its right principle. The preamble of that statute bears considering the great bust sustained by His Majesty's lieges by the fraudulent dealing of parties who having annulled [alienated] their lands, and received great sums of money therefore, yet by their unjust concealing of some private right found in the land, the persons entitled to the land are prevented from great sums of money altogether unprofitable; which cannot be avoided unless the said private rights be made public and patent to her Majesty's lieges. The Act then appoints the amities, reversions, &c. to be registered within three score 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 at Edinburgh, or the register at Edinburgh. It is usual 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 a case (in prefixed to the register of leases andFreehold, c. 13, 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 con-
temporary Act, appointed to be kept, in which the keeper enters an outline of each document as it is presented to him. By the present practice, when a minute-book or other writing belonging to this register is presented to the keeper, he marks in the margin of the page the title of the party to which it relates. This is indorsed 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 name of the Keeper and the date when the deed is then returned. Registration volumes, with minute-
books accompanying them, are from time to time issued from the General Register-office to the district registrars, so systems of the documents may be kept in parallel without being tampered with without either interpolation or mutilation being easily perceptible. When a volume is finished, it is returned with the corresponding minute-book to the General Register-office, and is then bound, with the book for reference. The real titles of all the heritable property in Scotland are thus preserved in a seriæ and indexed collection, in the General Register-house at Edinburgh. When property is offered for sale or mortgage, a search of this register is made, and the title is then referred to the parties treating for it. This is a certificate by the proper officer, describing all registered documents regarding that particular piece of land which have been recorded. The documents which are to be registered have lately been much simplified and abbreviated by the register the performance of the real title which may be registered within the sixty days of the presentation. It appears that the title is not necessary to set a title; and if the receiver of a conveyance have an absolute reliance on the integrity of the grantor and all the parties from whom that person may have derived his title, he may defer completing the conveyance, and may encounter the risk of some other person obtaining a title and getting on 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. 430). In the meantime the reformation of the law went on 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 death of any of these lands each county, for want of which within a certain time fixed after the sales, such sales shall be void, and being so registered that land should not be subject to any incumbrance, thereby this word incumbrance is altogether unprofitable in effect; it took up three months' time before it could be ascertainment by the committee.' Registration for Execution is 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 county court, the party competent to the deed may apply to the court, that 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 stated. 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 (1019, c. 20) 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 signature of due protest, and must bear evidence that it has been protested. The operation of this system was much widened by the Act 1 & 2 k. c. 114, which extended regis-
tration for execution. The Sheriff of the Shire, and the Register of the Sheriff. REGISTRY OF SHIPS. [Shire, P. C. J.]

REGNARD, JEAN FRANCOIS, was born at Paris, according to most accounts, in 1647, though in a short biography prefixed to a collection of his works (Paris, 1819 4 vols. 18s.), he is said to have been born in 1565. 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 1676, a date which, connected with other circum-
stances, renders it probable that 1656 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 Provençale, a Provençal love-suit, in which the lady and her husband were induced by him to visit France, and for that purpose they sailed from Civita Vecchia in an English vessel bound for Toulon. On the voyage, however, the ship was taken by the 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 the well manner of Regnard's style. 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 skill-
ful preparation of the noblest dishes, according to the latest principles of Parisian cookery. His culinary abilities secured for him the good will of his master and the favour of the
of his household. During his captivity he was taken to Constantinople, where he remained two years. On his return to Algiers he was ransomed for a considerable sum by the French consul; a ransom which came most opportunely, as he was about to suffer the last penalty for an intrigue in which he had been detected. He took with him to France the chain he had worn as a captive, which he carefully preserved. However, he was not observed by his unlucky adventures, and, on the 26th of April, 1681, he 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. He continued his journey by way of Tornea, ascended the river of that name, and reached the borders of the Finnish Ocean. On one of the rocks of the mountain of Mietwars, the limit of his excursion, he engraved the following Latin verses:

Qulla non pennis; victis non Aenea; Graecum
Haustatum, Hispanique causas Iustissimam eram,
non caput vertendarum, sed gaudium
His tandem statim suscuerat ob festit erit.

(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 December, 1685, where, satisfied with the wandering life he had led, he determined upon settling. Having purchased some land which lay in a wood near Tours, where he devoted 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 estate purchased near Paris called '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 only to Moléire; and Voltaire has remarked that 'no one can appreciate that great dramatist who feels no pleasure in reading Regnard.' His finest and most perfect productions are the comedies 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 Moléire. 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 transmuted his own experience upon the subject into the language of the most beautiful and energetic poetry. His next best piece is 'Le Sépulcre Universel,' in five acts, in which the humour and the versification are alike deserving of admiration. (P. C. vol. 2.)

Regnard probably possesses similar merit to the two which we have mentioned, he would have relieved French literature of the reproach which has often been felt of having no worthy successors to Moléire. The fault into which he has fallen is, that, like Piron, Greissel, and Marivaux, he has rather delineated an exaggerated representation of some particular vice or folly, that incident, original, natural 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 Distrait,' which appeared in 1697, and is taken from one of the characters of La Bruyère. This piece failed on its first representation, but was produced in 1731, reproduced in 1731, reprinted in 1733, and, is not now in the French stage with considerable success. 2, 'Démocrite' (1700). 3, 'Les Ménecomes' (1705); a comedy dedicated by the author to Boileau on a reconciliation with him which his friend had effectuated; between these two poets there had been a long literary warfare [Boileau, P. C.]; it is rather an imitation of the Médécines of Rotrou than of the antient comedy of Plautus. His shorter pieces are mostly in prose; the principal of them are,—1, 'Le Divorce,' in three acts (1688). 2, 'La Descente de Mezétin aux Enfers' (1689). 3, 'L'Homme à bonnes Fortunes' (1690); Regnard has also written a criticism on this comedy in a small piece of one act which appeared in the magazine of the year. 4, 'Les Enfants d'Érantes' (1690). 5, 'La Coquette' (1691); all in three acts. 6, 'Les Chiens' (1692), four acts, and several one acts. 7, 'Le Sérénade.' 8, 'Le Foire de St. Germain,' &c. He also wrote an opera called 'La Malavie,' in five acts (1699), the music of which is by Campra, and a tragedy called 'Sapor,' which has not been represented. His other writings are some Epistles and two Satires, one of them directed against Boileau, another against husbands, which have not been much noticed. Regnard has also composed a relation of his various travels, and the Provençal already alluded to.

The best editions of his works are those by Lequien, published in 4to., 6 vols. 1721, and by Craulet in 1825 and 1826, 6 vols. 8vo.

REGULATORS OF MOTION. Fly wheels are the means usually employed to render the movements of machines and clocks more regular. To some considerable extent, the applications of these have been described under WHEELS, (P. C. p. 316, col. 2), and under STEAM-ENGINES (P. C., p. 447, col. 1). Pendulums, as regulators of motion for clock work, are described under PENDULUM (P. C.); and the Governor, by which the supply of steam is regulated, has been described under STEAM-ENGINES (P. C., p. 415, 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 or shaft about 20 feet high, 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 and cause the shutters to open and close the mouth of a guttering air-vessel. In 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. 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 Bonn, where he very successfully completed his studies. Having been appointed 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, 'Ondine, ou les Francais 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 applause. 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 Cantatas, and at an annual concert of the orchestra of the Prussia, who was a superior performer on the piano-forte, and who desired instructions in composition from Reicha, he prepared to visit Berlin; but the death of that accomplished and有能力的 musician obliged him to change his plans. He returned to Paris, and gave a course of lectures on composition, which were well attended; and some quintets for wind-instruments which he there produced, were much admired.

Reicha, Capriccio de Poesie, Passamezzo, from the Opéra Comique, was allowed only a single representation, and that a stormy one. In 1816 he produced, at the Academie Royale de Musique, 'Nathalie, ou le Familier Suiss,' and in 1823 'Sappho.' But this able theoretician and learned harmonist had not the talent for creating melody, which genius alone can produce; and he might with propriety have said to his disciples, 'I pursue 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 Mehl, in 1818, there he attracted a numerous class of pupils, many of whom, crowned by the Institute, have since 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 them known in most parts of Europe, and according a considerable degree improved the study and advanced the knowledge of music. These opened to him the doors of the Institut de France, in May, 1835. Unfortunately for the administration of that science, his death took place in May, 1836. His chief works on the theory of music are,—1, 'Traité de Mélocie,' &c. 4to., 1814; 2, 'Cours de Composition Musicale,' 4to., 1818; 3, 'Traité de l'harmonie, du Cours pratique à deux Parties,' 4to., 1840; 4, 'Art du Compositeur...
Escutcheons and as narrow piers between the columns, so that the middle one predominates, both as to the quantity of surface: the openings occupy, and the architectural character occasioned by it. One of the earliest importations of the Renaissance into this country, Longleat House, Wilts, erected by John of Padua, 1567, for exalted family of 'taste' displayed in it, is an instance of such mode of composition, and shows how greatly the borrowed style was transplanted into the English house, even when treated 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 employment of coupled columns or pilasters, which was in some cases (as at Wollaton Hall) caused by the necessity for wider piers between the windows, at the same time that the intercolumns 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-
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 1630) the Château de Madrid in the Bois de Boulogne, whose façades were decorated with coloured glazed bricks or enameled tiles, constituting a species of polychromic decoration. Of the building nothing now remains, it having been taken down at the end of the last century; but another architectural specimen of the same period exists in the case of the house of the late Sir Edwin Chadwick, of Nor- 

tinal, which has added some polychromic *fayence* decoration, plans, elevations, and sections, are given in Normand’s *París Moderne*, but being only in outline, a great deal of the effect is lost in them. The palace of Fontainbleau itself, in its interior at least (now restored by Louis Philippe), records the magnificence of Francis, his taste for splendour, and his liberal endowment of art.

In Germany, the castle or rather palace of Heidelberg would, if complete, have been a most gorgeous pile in the Renaissance style, as it showed itself in that country; and though now a ruin, the principal portion of the exterior is in such excellent condition as to admit us to a man’s house in a series of architectural engravings—and it is infinitely worthier of being so recorded than are the mere shapeless fragments of buildings—a few blocks of stone and columns which had been cut down for other purposes, and which are here because discovered where they were not before known to exist.

The architecture of Spain at various periods is as yet so imperfectly known that very little is known of its Renaissance edifices; but from the views of some of them in the *Español Artístico*, 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 two little volumes which contain all that is worth studying in the study will enable us to avoid what was faulty in it, and to catch some of its freedom and spirit without falling into the licentiousness for which it may justly be censured.

REPEAL OF STATUTES. [Statutes, P.C.

REPRESENTATION. [Denby, P. C.] REPTON, Humphry, 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, 1769. After being placed first at the grammar-school at Bury, and then at that of Norwich, he was sent to Cambridge, where he entered on the business of a merchant in the city of London, in the year 1764; a suitable place enough for the future merchant or manufacturer who was to be intent on trade—which seems, according to the best authority, to have been his father’s chief ambition for him—but almost the worst for the future landscape gardener, Dutch gardening being the very reverse of nature and picturesque landscape. At the age of sixteen he returned to England, and was placed in a merchant’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 general merchant by his father, and for a while affairs prospered with him; but after a few years took an unfortunate turn, owing to losses of vessels at sea, and other circumstances in trade; whereupon his health both his parent’s, he determined upon, following 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 experiments, gardening, and the study of rural scenery.

An event however occurred in 1783, which promised to open a widely different career from that in which he had lived so far, and that in future distinguished himself; for in that year his friend and neighbour Mr. Wyndham of Felbrig was appointed secretary to the Lord-Lieutenant of Ireland, and Repton, feeling that as the opportunity was presented for the exercise of individuals of 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 Suffolk and domestic privacy. There however he did not long remain, for compelled to retreat, he took a small house at Harrett, Essex, to which he became so much attached as ever to reside there. Just at this time (1784) he became acquainted with Mr. Loudon [Loudon, P. C. S.], 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, and the author of*Repton’s Essays on the Theory and Practice of Landscape Gardening,* 4th ed., 1803; *Inquiry into the changes of Taste in Landscape Gardening,* 5th ed., 1806; *Designs for the Pavilion at Brighton,* folio, 1808; [though these designs are said to have miscarried, and to have been rejected, as they contained no buildings for the accommodation of the Prince of Wales, and were, like the building afterwards erected by Nash, in a fancy Oriental style, they were not adopted]; and *Fragments on the Theory, &c. of Landscape Gardening,* 4th ed., 1816, in which he was assisted by his eldest son. These different publications on his art, which at their original price cost collectively 20s. 2d., were reprinted in 1840, by the late Mr. Loudon [Loudon, P. C. S.].

The octavo volume contains a portrait and memoir of the author from autograph memoranda (which has here been made use of). Though this compressed and economic edition has not the attractions of the larger folios, the plates, which are taken from the best engravings, and the colouring plates, the same subjects being shown in small woodcuts, it is far more convenient as a volume for perusal and study, and moreover contains several notes and remarks by the editor.

REPUBLICATION. [Wills and Testament, P. C.] RESEDA’CE, a natural order of plants belonging to the class of Exogenia. It has a many-parted calyx; the petals unequal, oblong and fleshy; the stamens sessile; the anthers 2-lobed, opening longitudinally; a 3-lobed 1-located many-seeded sessile ovary, scarcely closed, usually with 3-6 parietal filaments inserted into the disk, the filamenta erect, the anthers 2-lobed, opening longitudinally; a 3-lobed 1-located many-seeded sessile ovary, scarcely closed, usually with 3-6 parietal
placenta, sometimes surrounding a free central ovule-bearing body; 3 granular, acumen stigmas; campylocarpus, or amphiophylo ovules; the fruit dry and membranous or succulent, opening by valves or by splitting down the back of the placenta, forming a round placenta, or even hooded and 1-seeded; the seeds several, reniform, with a taper accrate embryo without albumen, and a radicle next the hilum. The species of this order are soft herbaaceous plants, or a few small shrubs with alternate entire or pinnately divided leaves, and minute gland-like stipules. The flowers in racemes or spikes. The genera are widely distributed in the Mediterranean and the adjacent islands.

A few species occur in the north of India, the Cape of Good Hope, and California.

No one of the species possesses any active properties. Reseda latifolia is the Woold, Wood, or Weld, that is used in dyeing.

Rhodea odorata is the common Mignonette.

It has lanceolate bluntish 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 full flower in March, which two more scarce and extensively cultivated.

The seeds should be sown in pots or transplant into pots 4 or 6 plants to a pot 4 inches in diameter. To obtain plants for flowering from December to February, a seedling should be potted when 2 or 3 inches high and the plants potted in September. The crop for March, April, and May should be sown in pots not later than the 20th of August; the plants from this pot will not be ready for planting out until the first of December. If the plants be kept in pots to rain whilst they are young; they must 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 to place 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 25th 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 autumn sowing (Hort. Trans., vol. 2).

The arborescent plant is called Tree-Mignonette. It may be propagated by seeds or by cuttings, which readily strike root. The young plants should be potted singly, and brought forward until they can be planted out in the establishment. The plants should be stood in a cool nursery, stick and all side shoots should be pinched off. As the plants attain a greater size they should be shifted progressively into larger pots. The plant being 2 years old, is of the species Reseda, 4. 128.

R. sudaria, a native of the south of Europe, with pinnatifid leaves and linear-lanceolate segments, trifid petals and 3-4- lobed capsules, is the order Reseda pluricostata. 5. 160. It grows at the present day on the way-sides in Attica and Corinth.

R. laten and R. fruticulosus are British species as well as R. latifolia. The former has 6 very unequal petals and 3-left 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 sandy places near the sea.

(Babington, Manual of British Botany; Don, Gardener's Dictionary; Barnett, Outlines of Botany; Lindley, Vegetables for Kitchen and Garden; Bourne, Vegetable Kingdom.)

RESULTING TRUSTS. [Trust and Trustee, P. C.]

Rham, William Lewis, was born at Utrecht, in the Netherlands, in 1778; and of this country his father was, we believe, a native, but his mother was Swiss. He entered Dr. Rham's house one to train in early life. He studied for some time at Edinburgh, with a view to the medical profession, but eventually he became his destination, and he entered at Trinity College, Cambridge. In 1806, he was twenty-eight years of age, and he was the first to publish his name appears on the Tripods as tenth wrangler. In 1808 Mr. Rham was presented by his college with a prize of fifty pounds for the living of Winkfield, Berkshire; and a few years afterwards the Nassau family presented him to that of Ferefield, in Norfolk. He died unmarried at Winkfield, after a short illness, on the 31st of October, 1843.

The life of Mr. Rham was characterized by active and unremitting usefulness as a parochial clergyman. He was the friend and confidant of the poor in the several parishes under his care, and was known to many of the inhabitants 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 endeavored to promote the best interests of his parishioners.

The school which Mr. Rham founded at Winkfield is that described by Mr. Tremenheere, 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, shed, etc. It is surrounded by two acres of garden, to which two more acres are added. The garden is cultivated, by the master and the boys, with the various agricultural crops, according to the most approved method and regulations. The industrial work originally projected for the use of the boys was—garden work, basket weaving, 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 manual instruction of the boys in the workroom has been little 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 most of even the smallest portion of ground, however apparently unpromising. The practical instruction, and the practical example, of which the pupils here have the benefit in their garden-work, will be greatly extended when the agricultural operations commence in the field just added to the school grounds. We shall enjoy the advantage of pursuing all the details of the most skilful husbandry, under the same good guidance, namely that of the benevolent originator of this institution, the Rev. W. H. Rham, so well known as an accomplished agriculturist. The boys 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.'
of the present day on the subject of agriculture, Mr. Rham was eminently fitted, by his excellent judgment and sound sense, to be useful to the country in the existing state of its agriculture, economy, and probably, we are one of the great industrial branches of the Royal Society of Agriculture. He was a member of the council and the committee of the Royal Society of Agriculture, from its formation in 1833. A volume entitled 'The Dictionary of the Farm,' which contains his views on all the principal subjects of interest to the agriculturist, has been published by C. Knight and Co. It is compiled, with the assistance of the late Mr. J. H. Rodwell, who also contributed to it, and which he wrote in the 'Penny Cyclopaedia,' the first article [Art. NATURAL, T. C.] being contributed by him in 1833, and the last (Yorkshire Agriculture, P. C.) in 1843, only a few weeks before his death. He was also the author of 'English Husbandry,' a short work written for the 'Farmers' Series of the Library of Useful Knowledge.' This work was founded on a pedestrian tour in Flanders, in which, for many weeks, he walked from farm to farm, enjoying the rough hospitality of an industrious population, speaking their language readily, and entering into their pursuits with the zeal of a skilful and sympathetic friend. The Essay on the Analysis of Soils, for which he obtained the prize offered by the Royal Society of Agriculture, is published in the Society's 'Journal,' which also contains some other valuable contributions from his pen. Not long before his death he had also commenced papers on agriculture and rural economy in the 'Gardener's Chronicle,' edited by Dr. Lindley.

Mr. Rham's correspondence on agricultural subjects, both in this country and on the Continent, increased his experience in the science; and he gave his opinion with the utmost readiness. Nor did he stop here, or remain content with having acquainted himself with extreme urgency and courtesy, but with uncommon ability upon which he had consulted very carefully. Great was the respect paid to his opinions, he gave them without the least dogmatism. In one of his last communications to a valued friend (Joshua Rodwell, Esq., of Alderton Hall, Suffolk), Mr. Rham has expressed a characteristic of his unassuming disposition and his deftience to humble practical experience, which men who have acquired a scientific knowledge of literature do not so apt to despise. 'Whatever,' he remarks, 'great chemists may say about the component parts of soils, I am persuaded they can never decide as to the aptitude of any soil to produce a crop still experience has shown it. I believe we have all overlooked some electro-magnetic qualities which we have not yet instruments to measure.' It was this reliance upon experience, in connection with a bold and searching investigation of theory, which rendered Mr. Rham's writings so well adapted for the practical man at the time. In the eagerness for improvement, a writer is best calculated ultimately to benefit his country who unites scientific attainments of a high character with a rational degree of richness of style.

RHAMNUS. [Artica, T. C.]

RHAPSODY (Rhaphis) is a poem sung by a rhapsodist, and is generally applied to detached parts of the Homeric poems, or the Odyssey, when composed by rhapsodists. But the word rhapsodist properly signifies one who sews or fastens things together; and it was especially applied to those who arranged or are supposed to have arranged the parts of the Homeric poems and of other old poems, so as to make one entire work of them, and who went about from place to place to sing and recite these poems. (Lindley, Flora Medica.)

From the Greek Soils, for fio, fio, and pirv, a measure, is an instrument by which the force of an electric, galvanic, or magnetic current may be measured. The word was first proposed by M. Pellet as a synonym for galvanometer; and it has since been employed by Professor Wheatstone in a general sense, together with Rheoscope, denoting an instrument by which the existence of an electric, &c. current may be ascertained; and Rheomotor, expressing any apparatus, as an electrical or galvanic battery, by which a current of that kind is originated.

The rheometer or galvanometer employed by Mr. Wheatstone is a glass cylinder resting on a stand, and containing within it a large, polished needle, which has been employed by Professor Wheatstone in a general sense, together with Rheoscope, the color of the gelatine, and other properties of the needle, which have been employed by Professor Wheatstone in a general sense, together with Rheoscope, denoting an instrument by which the existence of an electric, &c. current may be ascertained; and Rheomotor, expressing any apparatus, as an electrical or galvanic battery, by which a current of that kind is originated. The rheometer or galvanometer employed by Mr. Wheatstone is a glass cylinder resting on a stand, and containing within it a large, polished needle, which has been employed by Professor Wheatstone in a general sense, together with Rheoscope, the color of the gelatine, and other properties of the needle, which have been employed by Professor Wheatstone in a general sense, together with Rheoscope, denoting an instrument by which the existence of an electric, &c. current may be ascertained; and Rheomotor, expressing any apparatus, as an electrical or galvanic battery, by which a current of that kind is originated.

RHINANTHUS (from Rhin, a nose, and anthos, a flower), a genus of plants belonging to the natural order Aphanthaceae. They are regularly 2-celled, small subulate bracts and bracts of a hypogynous and 2-locular, in a long slender tube, the upper lip narrow, the lower trifid, with equal segments; 2 stamens inserted in the throat of the corolla, the anthers 2-celled, short, small, with one 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 ovate, bicorne, 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 reticulate; and sub-biennial; the flowers below a little inflated; the corolla, the outer or throat, 2 to 4 inches long and from 1 to 2 broad, and a feathery 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 the cinnamon and pepper they are used as an external application for ringworm.

(Lindley, Flora Medica.)
R. major has linear-lanceolate serrate leaves; the flowers in spikes, the calyx glabrous, the lobes of the upper lip of the corolla oblong; B. brasica inciso serrate, with an attenuated point, the seeds with a very narrow membranaceous border. This is the plant of British botanists, but the R. major of Koch has a broad membranaceous margin to the seed, and is a different plant from the British R. major. This is the corolla as prominent as the lateral lobes. This plant is found in meadows and corn-fields in the North of England, and also in Lancashire.

Several other species of this genus have been described, Koch, in his 'Flora Germanica,' bas five. R. minor, the R. rutila gallii above described, R. major, R. eletorophor, R. anagastica, and R. brasiliana. (Don, Gardener's Dictionary; Bebbington, Manual of British Botany.)

RHYNZODUS, a genus of fossil fishes from the carboniferous strata of Scotland. (Owen.)

BIODEA, a genus of fossil Ferns proposed by Presl.

The species belong chiefly to the Coal formation.

RHYNCHOSAURUS, a genus of fossil reptiles. It was found in the new red sandstone of Grinimal in Warwickshire. (Owen.)

RHYNCHOSPORA, a genus of plants belonging to the natural order Cyperaceae. It has few-flowered spikelets, 6 to 7 flowers to a spikelike, long and slender, the nut compressed, convex on both sides, crowned with the dilated base of the style. There are two British species; R. alba, not uncommon on turf, and R. fusca, a rare species found in Cornwall and in Ireland. (Bebbington, 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 Ribalbta was not sufficiently advanced in his profession. Upon this he determined to go to Rome, and his mistress, to support his faith and to. At Rome he studied the works of Raphael, and particularly Sebastian del Piombo, and, according to Cean Bermudez, those of the Carracci also; but this is an error; none of Ribalbta's works were seen in Rome before 1600, some years afterwards Ribalba 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 his entrance 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 Ribalbta.' 'Ribalbta himself bas done it,' said his daughter, and of course the master was fully satisfied. Ribalbta soon obtained great reputation. His first public work was the Last Supper, ordered by archbishop Don Juan de Ribera for the grand altar of the college of Corpus Christi, at Valencia, and finished in 1554. He was also the painter of the place Pedro Munzo as St. Andrew; and as Judas, a shoemaker, the master of the name of Pradas, whose veneration was a nuisance to him. He died in 1598, and was buried in the church of San Juan del Mercado, in Valencia.

Ribalbta's design was correct and vigorous; he was a good anatomist; and his compositions are often grand. In colouring also he was generally good, much resembling Sebastiano and Titian, though occasionally dry; but the works of some of his principal scholars, as Castanial and Bous, are sometimes attributed to him. His works are or were very numerous in Valencia, and there are several at Castellon de la Plana, and Madrid; and some at San Ildefonso, Toledo, Zaragoza, Andilla, Algemesi, Torrecat, Portaceli, Morilla, and Carcascante.

The Entombed' by Ribalba, in the cathedral of Valencia, is an excellent work, and there are also many admirable pictures by him in private collections in Valencia, as those of the Conde de Parcent, and the Marques del Rafol. The Corey Collection, in London, contains a very fine picture of Ribalba and a banana tree. The museum of Ribalba. It was founded by Ribalba's patron, the Archbishop Juan de Ribera, commonly called 'El Santo Ribera.' He was canonized in 1797. Ribalba is to be seen to great advantage in the church of San Lorenzo, where he contains some of his greatest works, as 'San Vicente de Ferrer visited on his sick Bed by our Saviour and Saints; the 'Last Supper, already mentioned; and a 'Holy Family.' In other parts of the same building are 'Christ in the Garden of Olives;' 'Christ at the Column,' and 'the Acts of Pilate' in a twon torb. There are also some works by Ribalbta in the Museo (the former Carmen) of Valencia. The pictures of the church of the small hallowed of Andilla are also among the best works of Ribalbta. At Seville, in the church of San Martin de las Monjas, is also a noble picture by Ribalbta of Christ descending into Hades. In the church of his native place Castellon de la Plana there is still a 'Purgatory' by him; other fine works that were in his day have disappeared. The picture of 'Christ bearing his Cross' in Magdalen College, Oxford, of which there is a print by Sherwin, and which was ascribed to Guido, Lodovicio Caracci, and to Mondei el Divino, is, according to Dr. Forth, certainly a picture by Ribalbta. It is in the chapel altar-piece, and was presented to the college by William Freeman, of Hamlets, in Hertfordshire; it was originally brought from Spain by the last duke of Ormond from Vigo in 1797.

Juan de Ribalba, an able painter, and of great promise, was the son and pupil of Francisco, but he died in the same year as his father, aged only 21; he was born in 1567. Ribalbta also, or Spagnolo, is said to have been the pupil of Ribalbta.

(Cean Bermudez, Diccionario Historico de los mas illustres Profesores, etc.; his fellow travelers in Spain, etc.; English Connoisseur; Oxford Guide.)

RIBGRASS. [PLANTAGINACE. P.C.]

RICCIO, DOMENICO, called Il Brusasorci, a celebrated Venetian painter. He was born in Verona in the year 1655, a pupil of Gildino, and is supposed also to have studied under Titian, in Venice, where he at least studied his works and those of Giorgione. He is called the Titian of the Venetian painters. His name of Brusasorci (rat-burner) was acquired from his father Giacomo Riccio, who invented a rat-trap, and had what he cooked in his own house burnt, whence he was commonly called by his neighbours Brusasorci, a name which was descended to his children and grandchildren. Among Domenico's first and principal works in Verona were the frescoes of the Palazzo de' Murari, near the Ponte Nuovo, which he decorated exteriorly in chiaroscuro with scenes from the fable of Cupid and Psyche, and the marriage of Emperor Claudius (the Lago de Garda) with the nymph Charis represented by Garda; he painted numerous nymphs, with Hymen, as he is described by Catullus (Carmen 61-2), and all the characteristics of rural and sylvan life, pastoral and real; and also in distinct compartments extensive groups of marine deities, and other corresponding mythic evocations, for all of which he received only forty ducats. In the Palazzo Riodli he painted the celebrated .valence of Clement VII. and Charles V., at Bologna, on the consecration of the emperor, in which he introduced many portraits; these frescoes are still in preservation. Riccio painted also many excellent works in oil, including several large figures of saints for several churches in and near Verona, and other works in the ducal palace in Mantua. Venuses and nymphs were also favourite subjects with him; and such pictures frequently occur in picture galleries.

Ricci, of Verona, 1612—1693.

Felice Riccio, or Brusasorci, his son, was also a distinguished painter; but having studied under Ligozzi at Florence, he painted in a different style from his father: more delicate, but with less power; he was a good portrait painter. He died in 1605, aged 63. His sister Cecilia Brusasorci was also an excellent painter of portraits. Giovanni Battista Brusasorci, another son of Domenico, was painter to one of the German emperors, and died in Brussels.

(Ridolfi, Vite de' Pittori Veneti, &c.; Dal Pozzo, Vite de' Pittori Veronesi; Lanz, Storia Pitteria, &c.)

RICHARDSON, WILLIAM, the son of a parish clergyman in Perthshire, was born in 1743. He was educated for the church in the university of Glasgow, became tutor to the sons of Earl Cathcart, and spent two years with these youths at Eton. In 1770, when he returned to Scotland and basillar extraordinary to Russia, he accompanied the company to St. Petersburg, where he acted for four years as the early private secretary. In 1778 he was appointed professor of German in the University of St. Andrews. In 1783 he was assistant and secretary of the office till his death, which took place in 1814. Professor Richardson was a highly popular and successful teacher, and also published several literary works of some celebrity. He was the author of a book of tales, the translator of a ring, and the author of two dramas, of 'Anecdotes of the Russian Empire,' and of a series of periodical essays called 'The
Philanthropy.' 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 was rapidly sold. There are several which 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 censures from Mr. Knight and some other recent critics.

RICKMAN, THOMAS, a distinguished writer on Gothic architecture, whose work has become a standard authority in a branch of literature where there is so much to be done, is a very well known to his followers, and perhaps to others also. His first work, published in 1801, was a Series of Papers on whose personal situation is so little known; but it is very 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 Maidenshead 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. In the year 1798, liking the determined course he was pursuing, he changed his situation only that he might obtain admission into the employment of Messrs. Day and Green, extensive grocers, at Saffron Walden. His residence at Saffron-Walden was not, however, very promising, and occasioned, with his wishes of 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 further from than bring him at all nearer to his ultimate destination. Nevertheless it proved a stepping-stone to him, so far as 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 unpromising 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 part of his life, a missing phase of his career altogether in uncertainty as to the influence or impulse which directed him to a pursuit so remote from his habits and employments.

In 1817, 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 encumbered 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 contractor, and a design sent in by him being accepted, he determined to establish himself as an architect: he quitted Liverpool andremoved to Birmingham, as being in his opinion a likelier situation for obtaining practice from various quarters. Having no practical experience at that time himself, and being unacquainted with the business of the profession, he engaged Mr. E. Hutchinson as his managing assistant in all matters of business, and after his death (1850) 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 published in 1801, and reprinted in 1821, would have deserved a place among the rare volumes of the British Association for 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 one 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 Encyclopaedia. The work itself, however, recommended him to all lovers of Gothic architecture whatever their personal literary tastes may have been, and procured him patronage in very influential quarters, where as a seceder he could hardly look for direct censure and employment. It is to be observed however that 'lastly'—by which it 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 has ever completed 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 regretted that it is a mere list, without so much as any dates. This 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 by his biographer, Mr. Hussey. Perhaps a full memoir of Rickman will then be given; and one very desirable improvement it would be to write a descriptive catalogue of his buildings to be illustrated by wood-cuts of them— if not of all, of the best among them.

RIGIDITY OF ROPES. In estimating the powers of machines, it is frequently necessary to take into consideration the effects arising from the rigidity or stiffness of the ropes 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 diameter, for we are in the same time, the other part should take such a direction that a vertical line drawn through the attached weight cuts the horizontal diameter at a point beyond the extremity of the latter, the distances of these parts, and from the extreme diameters of the pulleys are represented by and 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 (R - z) = W' (R + z')

But, if W be the weight which by descending raises up the other, the value of z is generally small the distances may be disregarded, so that we have, in the case of equilibrium,

W = W' (R + z') or again, W - W' = W' 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' R'.

The formula given by Coulomb to express the force necessary for overcoming the rigidity of a rope, or the equivalent of W' R' is

R (a + 4W')

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 m, a and b may be determined by experiments made
RIZ, DON FRANCISCO, a distinguished Spanish painter, was born at Madrid in 1608. He was the pupil of Vincente Carducho, and had an extraordinary readiness of invention. At the age of twenty inclusive, Rizi was already known as a master; but the time was not yet matured for such superficial and incorrect: still his readiness to design and facility to execute ensured him a brilliant career. It was not till 1656, 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 1659 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 Spanish cathedrals has at one time numerous and important. Francisco Rizi is one of the most distinguished of those from whom the decline of painting in Spain is attributed, through the more superficial attractions of his works; and he is said also, by his eminence in the list of the theatre of Buenaventura, to have been equal in the arts of the altar. At the expiration of his period, 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 had also assisted in making, to contain the Host (La Santa Forma). The subject was the ceremony of the Crowning 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. [Coeleo, Claudio, F. C. S.]

The Host, or the Roman wafer which Rizi died at Gorkum in 1655 when tranquilled on the shoulders of Zwingli. Rudolf II., Emperor of Germany, gave it to Philip II. of Spain, whether it was transported in the world private churches, or was in 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 magnis operis miraculis, intra sancta envoles, altaeque tabernaculis suportatae! In the Host, or the Roman wafer, the wafer is exhibited for adoration, the picture, which forms a veil, is let down, and is accordingly much injured. The French, under La Houssaye, who pillaged the Escorial in 1808, carried off an altar and the monks hid the wafer in a cell, and it was restored with great pomp by Ferdinand VII. in 1814.

The pictures, both frescos and in oil by Rizi, are very numerous; there are several in the Museo del Prado at Madrid, and many in the churches of Madrid and Toledo, especially in the cathedral of Toledo. FRAY JUAN RIZI, Francisco's eldest brother, born at Madrid in 1656, was also an eminent painter. His principal works are 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 Monte Casino. He was then made an archbishop, in 1675, by the pope Clement X., but he died in the same year at Monte Casino before entering upon the duties of his office. (Coeleo, Claudio, F. C. S.; Ford, Guide for Travellers in Spain.)

ROADS. In Scotland the public highways used for purposes of general transit throughout the country, and suited for the use of vehicles, are under several different kinds of management. The country in general, with the exception of some Highland districts, is penetrated by turnpike-road, managed by district trusts in terms of local statutes. These are interpreted along with the Act 1 & 2 Wm. IV. c. 43, for the general regulation of turnpike-roads. According to returns of the rents of the various bars, 'the smallness of the sum at which tolls are occasionally farmed is consequent on the opinion that the Mary's right does not exceed 10/- Thirty-six bars bear to have been let for sums not exceeding 201. each, and the number let at sums between 201. and 100/. is 338.' (Local Taxes of the United Kingdom, published by the Board of Inland Revenue.) 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 small in proportion to the sum paid by the public, as the road is on a revenue annually needed for the upkeep by fire, otherwise. Rizo was decorated with the order of Santiago; he died at Seville in 1626. Antonio's son, Fernando del Rizo, was a good fresco painter. (Coeleo, Claudio, F. C. S.)

M.S. COELLO, Claudio, F. C. S.}

Civil, and the modern roads in the fabric of the parishes, and 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 landed proprietors and the commissioners of supply in the several counties, agreeing to relieve the parliamentary commissioners of the burden of the duty 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 clear law state in Scotland. The right of transit in such cases is founded on the Roman system (service), a system where the public enjoy it, generally rests on the title of the occupant of some districts or land having a right of pathway through some adjoining place. Sometimes the right is of a personal nature, and the occupation of the work is for the benefit of some tenant on some tenement. At other times it is in the possession of a community, as a village or parish; and in such a case it is not lawful to stop any person who may use the path, on the strength of the title. Such paths are virtually public; but there is no such principle applicable to them as that which regulates the publicity of a highway in England by rendering the parish 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. 1 2.
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 preserved, 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 render the further escape of the juices impossible.

The loss of weight in roasting meat is much greater than by boiling: 'By this latter process, nutmeg loses one-fifth, and beef one-fourth; but by roasting, these meats lose about one-tenth.' In roasting, the fat arises from melting out of the fat, and the evaporation of the water; but the nutritious matter remains condensed in the cooked solid; whereas, in boiling the gelatine is partly abstracted. Roasted meat is also more tender than boiled, and is softer, sweeter, and 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—absolutely important.' See Dr. Kitchener's 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, roasting it slowly; for thought the latter stage of the meat contains most nutriment, yet it will be less digestible on account of the density of its texture. This is of importance, remember, when it is intended for the diet of convalescents, for whose edified and roost meats are preferable to boiled surfeit.

ROATAN, or Ratan, is an island in the Caribbean Sea opposite the coast of Honduras, one of the states of Central America. It lies between 10° 6' and 10° 10' N. lat., and between 87° 56' and 87° 20' W. long., and extends from east to 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 100 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 activity 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 600 feet above the sea-level. The woods abound in deer, wild hogs, gibbonas, 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. The British formed a settlement here in 1742, when they had numerous settlements on the Mosquito Shore, but it was abandoned in 1783, when the English withdrew their garrisons from the Mosquito Shore. In 1794, when the Crown of St. Vincent were expelled by the English and were compelled to submit, nearly all the prisoners with their families were transported to Boston. But they soon abandoned the island, and passed over to the continent of America, where they settled near Truxillo, in which town their descendants still form the bulk of the population. When Orlando Roberts visited Ratan (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.

(Handerson, Account of the British Settlement of Honduras, &c.); Orlando Roberts, Narrative of Voyages and Travels on the East Coast and in the Interior of Central America.)

ROEBUCK, JOHN, M.D., the son of a Sheffield manufacturer, was born in 1718, received a liberal education at Northampton under Dr. Doddridge, and subsequently at the University of Leyden, and settled in Birmingham as a physician. Pursuing an early taste for chemistry, he introduced some improvements in the processes of refining gold and silver, and subsequently in connection with M. J. D. Garbett, an extensive refinery and chemical manufactory at Birmingham. He there effected such improvements in the manufacture of sulphuric acid (formerly called vitriolic acid, or pyrolitic acid), and by other modifications of the process, as enabled him to reduce its price from sixteen-pence to four-pence per lb., and thus to render it available for many new and important purposes in small and large quantities. Recently, in connection with Garbett, he established, in 1749, vitriol-works at Prestonpans for the purpose of bringing these improvements into practice, thereby rendering a great service to our rising manufacture. He died in a house which he had built at Carrownearne, where he chiefly designed the furnaces and machinery, calling in the aid of Smaaton, and subsequently of Watt. The first furnace at this establishment, the formation of which constitutes an era in the history of British manufactures, was blown on the 1st of January, 1760. Unfortunately for himself, Roe buck subsequently became the lessee of extensive coal and salt-works at St. commutation 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 his no средства is now devoted to the production of iron. He is 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, of which he was a member, it is stated he has been the author of a few papers road before that and the Royal Society of London, and to have published two political pamphlets.

ROELAS, JUAN DE LAS, one of the most distinguished of the Spanish painters, commonly known among Andalucian artists as el Cértico Roelas, was born at Seville, of a distinguished family, about the years 1555 and 1560: his father, Pedro de las Roelas, was a Spanish admiral in 1566. Roelas is styled in documents and in books el licenciado Juan, which signifies, probably, merely that he was a graduate of the University of Seville. Little is known about his education: he is supposed to have studied in Italy, and, from his style, with some of the scholars of Titian in Venice. In 1603 he painted four pictures for the college of Jémez. From 1607 until 1624, he lived chiefly at Seville and Madrid; and in 1616, after the death of P. Castello, he was a competitor for the place of cabinet painter to the king, Philip III.; notwithstanding the many years' service of Roelas's father, however, Bartolome Gonzales succeeded Cas tello. Roelas next painted one of the canvases of the college, but he died there in the following year, April 23rd, 1626. Francisco Zurbaran was the scholar of Roelas. The works of Roelas are very numerous in Seville; and there are still many in the College of Jémez, and there are some at Madrid. His masterpiece is the death or el Trasno of San Isidoro, in the church of that saint at Seville; this is a large majestic composition, in two compartments, common to the communion of St. Jerome by Domenichino, and other Italian pictures, but on a larger scale. In the lower part is the archbishop in a church in the attitude of prayer and about to die, supported and surrounded by his numerous clergy, among which are some magnificent heads; in the upper part of the picture is our Saviour on his throne, with the Madonna by his side, and surrounded by angels; the attention is chiefly directed to the central figure; the picture, it appears, has never been engraved; indeed, very few good Spanish pictures have been engraved, and it is owing to this circumstance that the great painters of Spain are so little known out of their own country. The principal church devoted to St. Isidro is the Sant Iago, in the Capilla de Santiago, in the Cathedral of Seville: the saint is riding over Moors; it was painted in 1609: Bermudes speaks of it as full of fire, majesty, and genius. In the same cathedral is the celebrated painting of glass von Bessa, now in the museum; it is surmounted by the picture of the Conception, by Roelas, in the academy; and by three in the chapel of the University of Seville—a Holy Family, with Jesus; a Nativity; and an Adoration of the Kings: the picture of the Adoration, painted by a monk called Jesus: of Roelas: 'Pethico, who was cousin...
of pictures in Seville [Pacheco, P. C. S.], reproached Rodan with want of decorum in a picture, in the Mercado Calzada, of St. Anne teaching the Virgin to read, for representing some sweeter beauty than he had shown in a principal apothegm in 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.

The second picture of the same 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 colouring, he may be compared to the Venetians. His last picture is apparently the Nativity, at Olivaros. Palomo's account of this painter is almost wholly incorrect; he calls him Doctor Pablo de las Roelas.

(Dean Bermúdez, Diccionario Histórico, &c.)

ROEMERIA (named after Dr. John James Römer, professor of botany at Landshut; he was author of several botanical works, and died in 1620), a genus of plants belonging to the natural order Papaveracées. It has 4 petals, numerous stamens, 2-4 sessile stigmas, an elongated 2-4-valved 1-seeded capsule with distinct placents. The species are annual herbs yielding a yellow juice, with violet flowers.

R. Apyride, Hybrid Roemert, 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, 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. obtusiflora, have been described, the first a native of Tauria, the second of Syria.

(Dean, Gardener's Dictionary; Balfour, Manual of British Botany.)

ROMAN ARCHITECTURE. [CIVIL ARCHITECTURE, P. C.]

ROMAN CATHOLICS AND JEWS. An act was passed on the 18th August, 1846, § 10 Vict. c. 59, intituled 'An Act to restore to the Crown the ancient Jurisdiction over the Established Church, and abolishing all Forborne Power repugnant to the same,' and of an act of the Parliament of Ireland passed in the second year of the same queen's reign, (2 Vict. c. 1, [1]) intituled 'An Act restoring to the Crown the ancient Jurisdiction of the State Ecclesiastical and Spiritual, and abolishing all Forborne Power repugnant to the same,' as makes it punishable to affirm, hold, stand with, set forth, maintain, or defend, as therein is mentioned, the authority, pre-eminence, power, or jurisdiction, of any foreign, spiritual, or ecclesiastical, of any foreign prince, prelate, person, state, or potentate theretofore claimed, used, or usurped within this realm, or any dominion or country being within or under the dominion and authority of his said majesty's dominions, shall diligently and faithfully, having no lawful or reasonable excuse to be absent, endeavour themselves to resort to their parish church or chapel accustomed, or, upon reasonable let thereof, to some usual place where common prayer and such service of God shall be used in such time of let, upon every Sunday, and other days ordained and used to be held as holy days, and then and there to abide orderly and soberly during the time of common prayer, preaching, or other religious service of God there to be used and ministered, upon pain of punishment by the censure of the church, for the same affects persons dissenting from the worship or doctrine of the United Church of England and Ireland, and usually attending some place of worship other than the Established Church: provided always, that no poulney premises shall be used upon any person by reason of his so absenting himself as aforesaid. [Members of the United Church of England and Ireland are still liable to the censure of the church, if they do not attend the services; those who do not assist除外 from these censures if they usually attend some other place of worship. Members of the United Church of England and Ireland are however protected by this act against pecuniary penalties for non-attendance at church; and no person shall be excommunicated, or, upon reasonable let thereof, to some usual place where person or persons inhabiting and being within this realm, or any other the king's majesty's dominions, shall, after the said feast of All Saints, willingly and willingly hearing and being present at any one of the said services, or such services as the king's majesty by the administration of the sacraments, of making ministers in the churches, or of any other rites contained in the book annexed to this act, is mentioned and set forth in the said book, or that is contrary to the same, and every such person, or any of them, by the verdict of twelve men, or by his or her own confession, or otherwise, shall, for the first offence suffer imprisonment for six months, without ball or mainprize; and for the second offence, being like manner convicted and committed for this term, or any term, for one whole year; and for the third offence, in like manner, imprisonment during his or their lives.'

Also so much of the said act as enacts, 'that for the more knowledge to be given hereof, and better observation of this law, all and singular curates shall, upon every Sunday in each quarter of the year, during one whole year next following this foresaid feast of All Saints next coming, read this present act in the church at the time of the assembly, and likewise once in every year following, at the same time declaring unto the people, by the authority of the Scripture, how the mercy and goodness of God hath in all ages been shown to his people in their oppressions and extremities, and at the same time making and putting on record and in writing, such hearty and faithful prayers made to Almighty God, especially where people be gathered together with one mind and heart to offer up their hearts by their prayer as the best sacrifices which Christian men can make.'

Also so much of any act or acts of the parliament of Ireland as may have extended to Ireland the provisions of the said act of the fifth and sixth years of the reign of King Edward the Fifth, as far as the same is applicable to Ireland.

Also so much of an act passed in the first year of the reign of Queen Elizabeth (1 Eliz. c. 1), intituled 'An Act to restore to the Crown the ancient Jurisdiction over the Estate Ecclesiastical and Spiritual, and abolishing all Forborne Power repugnant to the same,' and of an act of the Parliament of Ireland passed in the second year of the same queen's reign, (2 Eliz. c. 1, [1]) intituled 'An Act restoring to the Crown the ancient Jurisdiction of the State Ecclesiastical and Spiritual, and abolishing all Forborne Power repugnant to the same,' as makes it punishable to affirm, hold, stand with, set forth, maintain, or defend, as therein is mentioned, the authority, pre-eminence, power, or jurisdiction, of any foreign, spiritual, or ecclesiastical, of any foreign prince, prelate, person, state, or potentate theretofore claimed, used, or usurped within this realm, or any dominion or country being within or under the dominion and authority of his said majesty's dominions, shall diligently and faithfully, having no lawful or reasonable excuse to be absent, endeavour themselves to resort to their parish church or chapel accustomed, or, upon reasonable let thereof, to some usual place where common prayer and such service of God shall be used in such time of let, upon every Sunday, and other days ordained and used to be held as holy days, and then and there to abide orderly and soberly during the time of common prayer, preaching, or other religious service of God there to be used and ministered, upon pain of punishment by the censure of the church, for the same affects persons dissenting from the worship or doctrine of the United Church of England and Ireland, and usually attending some place of worship other than the Established Church: provided always, that no poulney premises shall be used upon any person by reason of his so absenting himself as aforesaid. [Members of the United Church of England and Ireland are still liable to the censure of the church, if they do not attend the services; those who do not assist除外 from these censures if they usually attend some other place of worship. Members of the United Church of England and Ireland are however protected by this act against pecuniary penalties for non-attendance at church; and no person shall be excommunicated, or, upon reasonable let thereof, to some usual place where person or persons inhabiting and being within this realm, or any other the king's majesty's dominions, shall, after the said feast of All Saints, willingly and willingly hearing and being present at any one of the said services, or such services as the king's majesty by the administration of the sacraments, of making ministers in the churches, or of any other rites contained in the book annexed to this act, is mentioned and set forth in the said book, or that is contrary to the same, and every such person, or any of them, by the verdict of twelve men, or by his or her own confession, or otherwise, shall, for the first offence suffer imprisonment for six months, without ball or mainprize; and for the second offence, being like manner convicted and committed for this term, or any term, for one whole year; and for the third offence, in like manner, imprisonment during his or their lives.'

Also so much of the said act as enacts, 'that for the more knowledge to be given hereof, and better observation of this law, all and singular curates shall, upon every Sunday in each quarter of the year, during one whole year next following this foresaid feast of All Saints next coming, read this present act in the church at the time of the assembly, and likewise once in every year following, at the same time declaring unto the people, by the authority of the Scripture, how the mercy and goodness of God hath in all ages been shown to his people in their oppressions and extremities, and at the same time making and putting on record and in writing, such hearty and faithful prayers made to Almighty God, especially where people be gathered together with one mind and heart to offer up their hearts by their prayer as the best sacrifices which Christian men can make.'

Also so much of any act or acts of the parliament of Ireland as may have extended to Ireland the provisions of the said act of the fifth and sixth years of the reign of King Edward the Fifth, as far as the same is applicable to Ireland.
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 in the due time thereof during the said
reign 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 Eliz. c. 1, § 7; S. c. 9;]
Also an act passed in the fifth year of the same queen's
regin (5 Eliz. c. 1), intituled 'An Act for the Assurance of the
Queen's Royal Power over all Estates and Subjects within Her
Dominion.'
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
Instruments, and other superstitious Things from the See of
Rome,' so far only as the same imposes the penalties or punish-
ments 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
instruments, and that in all respects, save as to the said penal-
ties 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
and other Laws of the Realm, during the Reign of His Majesties
Successors,' intituled 'An Act to retain the Queen's Majesty's
Subjects in their due Obedience.' [LAW, CRIMINAL,
P. C. S., p. 178.]
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
protection of the Statutes against Jesuits, Seminary Priests,
Receivers,' &c. [PARENT AND CHILD, P. C.]
Also 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 on every day of that year, and such persons inhabiting this realm of England and the dominions of the same shall always upon
that day diligently and faithfully resort to the parish church or
church 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 Recusants.' [LAW,
CRIMINAL, P. C. S., p. 178.]
Also an act intituled tenth year of the same king's
regin (7 Jac. I. c. 6), intituled 'An Act for administering the
Oath of Allegiance, and Reformation of married Women
Recusants.'
Also so much of an act passed in the thirteenth and four-
teenth years of the reign of King Charles the Second (13 &
14 Car. II. c. 4, § 11), intituled 'An Act for the Uniformity of
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 laws 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
person teaching youth, being publicly punished for teaching
therein kept a force. [LAW, CRIMINAL, 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 necessity of such a law in this day.
There is still the 7th c. of the Church [CONSTITUTIONS AND
CARDS, ECCLESIASTICAL, P. C. S.], which goes farther than the statute
of Char:. II., but this canon may be safely neglected by any
act that shall be touch in 'publie house.' The canon forbids only men from teaching without
licence or subscription. At that time of days women probably
did not teach.
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.
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, § 6, [L.], as requires
the oath of allegiance from all such schoolmasters of children
in youth in private houses or families as tutors or schoolmasters
should take the oath of allegiance and supremacy, and as makes
such schoolmasters or other persons punishable for so instruct-
ing or teaching youth before licence 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 thirteenth 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 in 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, of his body, his heirs, or successors, shall be
sentenced to perpetual removal from the company of
ministers, and disabilities in this act mentioned or contained.'
Also an act of the parliament of Scotland passed in the
eight and ninth session of the first parliament of King
James the Second (11 & 12 W. III. c. 4, § 1), intituled 'An
Act for preventing the growth of Popery,' and all laws, sta-
tutes, 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 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 to prevent the growth of Popery.' [LAW,
CRIMINAL, P. C. S., p. 179; PARENT AND
CHILD, P. C.]
Also 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 Pro-
testant 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 year of the reign of the said Queen Anne (2
Anne, c. 2), intituled 'An Act for the further security of the
growth of Popery,' as enacts that 'if any person or persons
shall seduce, persuade, or pervert any person or persons pro-
fessing or that shall profess the Protestant religion, re-
ounce, forsake, or seduce the same from the Protestant
religion, or reconcile him or them to the Church of Rome,
then in such case every such person and persons so sed-
cing, as also every such Protestant and Protestants who
shall be so seduced, perceived, and reconciled to Popery,
shall for the said offences, being thereof lawfully convicted, incur
the danger and penalty of paupermire mentioned in the statute
of paupermire made in England in the sixteenth year of the
reign of King Richard the Second.'
Also so much of the said last-mentioned act of Queen
Anne (s. 3) as empowers the Court of Chancery to make such order
for the maintenance of Protestant children, as the said
parents, or any of them, and their assigns, are or may be
suitable to the degree and ability of such parents and to the
age of such child, and also for the portions of Protestant children
in the hands of the said parents, as the court shall see meet, and
to that child to whom such portions shall be given and
the ability of such parents, and as empowers the said court to
make such order for the educating in the Protestant religion
the children of Papists, where either the father or mother of
such child is dead, or where such child is not an infant
of ten years of such children, as to that court shall seem meet, and
in order thereto to limit and appoint where and in what man-
ner, and by whom, such children shall be educated (s. 4); and
as enacts that the father of literate children shall pay their
charges of such educator as shall be directed by the said
court.
And an act passed in the eleventh year of the reign of
King George the Second (2 Geo. II. c. 17), intituled 'An

Act for staving 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 investing in the two universities of Ireland, the effectual Grant of the Presentation of Benefices belonging to Papists, except so much of the said act as relates to any advozone, or right of presentation, collation, nomination, or donation of or to any benefices, or to the payment of the stipends or salaries, or to the continuance or otherwise of any grants, or to any 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 any benefice, right, or faculty, or any lands, 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. 5 ([I]), intitled "An Act for the Relief of His Majesty's Subjects of this Kingdom professing the Popish Religion," as enacted "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 may hereafter 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 (18 Geo. III. c. 60, s. 5), intitled "An Act for the Relief of His Majesty's Subjects professing the Popish Religion from certain Penalties and Disabilities imposed on them by an Act made in the eleventh and twelfth years of King George the Second, intituled "An Act for the further securing the Growth of Popery," as enacted "that nothing in this act contained shall extend or be construed to extend to any Papish 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 ([I]), intitled "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, Manufactures, Workmen, Seamen, Farmers, and others, as shall settle in this Kingdom," as enacted "as excepts 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 King George the Third (31 Geo. III. c. 92), intitled "An Act for the Relief of His Majesty's Subjects professing the Popish Religion by Law subject, as enacted (s. 12) "or the inhabitants of the Eastern Counties, or any other county or county, in the persons of any such persons, or of any person or persons, or of the persons and properties of such persons, as shall be assembled, or any person or persons hath any suit, benefit, or advantage to any person who shall, by preaching, teaching, or writing, deny or gainsay the oath of allegiance, abjuration, 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 enacted, "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 enacted, "that no Protestant communicant in 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 registered with the principal of the national schools for the county or other division or place wherein such school shall be situate, by the clerk of the peace of the said county, who is hereby required to record such name and description accordingly upon such book, 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 of this act."

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 ([I]), intitled "An Act for the Relief of His Majesty's Papists or Roman Catholic Subjects of Ireland," as enacted "that no Papist 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 in the same form, as is now prescribed by an Act passed in the thirteenth and fourteenth years of his majesty's reign, intitled "An Act to enable His Majesty's Subjects, of whatever Persuasion, to testify their Allegiance and to be known one of His Majesty's Subjects, and to be enrolled on his Majesty's 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 Papish Religion, doth inhabit and dwell, in open Court."

Also so much of an act passed in the said thirty-third year of the reign of the said King George the Third (33 Geo. III. c. 44), intitled "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 his majesty's subjects professing the Jewish religion, in respect to their schools, places for religious worship, education, and charitable purposes, and the property held therein, shall be subject to the same laws and regulations as Papists and other Dissenters; and it will enable any person to leave a legacy for the instruction of Jews in their religion, which up to the passing of this act could not be done. [Jaws, 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 his 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 nuisance any preacher, teacher, or person officiating at such meeting, assembly, or congregation, or any person or persons thereat, 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, Greek Empire, or Beaux Arts Empire, was the Roman Empire into which the 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 at work. The warlike pre-eminence 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 effective control. The reality and unity of the Roman government for the first three centuries of the empire, form a remarkable contrast to the disorders and embarrassment of the Parthic war and the frequent attacks of the Parthians. The several provinces were never separated from each other and from the capital, and were not united under a single government, but all together formed a part of the whole empire. The division of the Roman empire into two parts occurred 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. Dismemberment was not thought of. These contests however shook the whole framework of the empire: and as Italy lost its pre-eminence in warlike energy and political skill; and the emperors, on whose personal qualities, from the wars that occupied them, headed their states, and who were the only source of authority, declined in the condition and spirit of the empire depended, arose from provincial rather than Italian families; the sentiment of unity was weakened, and Rome was no longer felt to be the real...
capital of the empire. Had the empire, however, been as-
sailed by any hostile power capable of affecting the
safety of the whole, a sense of the common danger might have sup-
plied an incentive to all, but enemies existed to contend with, and apprehended little injury from
those who assailed the other portions of the empire. The
Germanic confederations of the Alemanni and Franks [Aka-
marius, P.C.] might now have acted as an additional
upper Danubian frontier, but neither Greece, Syria, Egypt,
nor even the lower Danubian provinces were endangered by
them: the Gothic [Gorthis, P.C.] might over-run Maesa and
little thought of the Rhianian side of the Hellenon; while the revived Persian kingdom, under
the dynasty of the Sasanidians [Persia, P.C.], which threatened the subjugation of the East, was little regarded in
Asia Minor. This mutual independence of the ass-
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 their more distant provinces. The military
command was exercised by the Emperor, and the
army was impracticable, rather than by water. Had the Halles-
con and the Boospor been wider, the separation would perhaps
have been made there; but the narrowness of those straits, the insufficiency 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-
mined to that part of the empire where the communication
by land, narrowed between the shores of the Adriatic and the
nearer part of the Danubian frontier, was impeded by the
difficulties of traversing the Illyrian islands of the great
Alpine chain. South of the Mediterranean, or 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
armies had crossed the Adriatic the Greek language had become
the language of literature and education in the countries to the
rest 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 as written
languages; but the prose, and, to a less extent, the
poetry of the Mediterranean, the Nile, and Egypt were
Greek. West of the Adriatic the Latin tongue acquired a
similar or even a greater supremacy: for it superseded, though
probably in no regular order of form, the Egyptian
dialects of the Coptic and Syriac languages in the
West and Spain and Italy in popular use, as well as for literary
purposes, and forms the basis of the modern languages of those
countries.

Some African provinces west of the Libyan desert pos-
sessed 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 important for
their military potentialities, e.g. Julius in the time of Diocletian, and Firmus and Hera-
drion in the reign of Honorius, to acquire independence in
Africa were soon put down; and the African provinces, until
their re-organization under Constantine, who subjected them in
subjection, except during a few brief intervals, to the sovereigns of the
West.

(A.D. 286.) The first emperor of the Eastern part of the
empire was Valentinianus, 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 Valentinianus,
P.C.; Flavius Maximianus, P.C.]

(305.) Valentinianus Maximianus flavus, usually known
as Galerius, who had, under Diocletian, governed the
Danubian Provinces, with the subordinate rank of Caesar,
succeeded that prince as Augustus in the East, and
reigned till A.D. 311. [Maximianus Galerius, P.C.]

(311.) Flavius Valerius Licinius and Maximinus Daza
or Daza Licinius and Maximus Valerius, 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
the ceremony of elevation, A.D. 307; and Maxi-
min, offended at the elevation of another to a rank superior
to himself, assumed the title of Augustus also. But both however
appear to have concealed a sort of precedence to Galerius
during his reign. After the death of Galerius the two em-
perors divided the East between them, Maximian having the Asiatic provinces, and
Licinius the European. The West was meanwhile (A.D. 312)
reduced under the sole dominion of Constantius. In A.D. 313
Licinius, with the assistance of the weak and helpless Maxi-
mian, was defeated by his rival, poisoned himself at Turin. 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 died nearly the whole of his European provinces to
the conqueror. After an interval of eight years, war was
renewed between them; and the defeat and capture of Lic-
inius (A.D. 324) reunited the whole empire under Con-
stantius. [Maximinus Daza, P.C.; Constantius, Flavius
Valerius, P.C.]

Family of Constantine.

(323.) CONSTANTIUS I. MAJOR, who reigned till his
death, A.D. 337. [Constantius, P.C.; Flavius Valerius, P.C.]

From him succeeding emperors seem to have taken in almost
every case the name of Flavius.

(327.) CONSTANTINUS I. In the division of the
domains of Constantine the Great among his three sons,
Constantius, the second son, had the East. He is known
as Constantius II., his grandfather, who was emperor of the
West [Constantius I. Chlorus, P.C.] being known as
Constantinus I. On the defeat of Magnentius, A.D. 353
[Magnentius, P.C.], the whole empire was reunited under
Constantius II., who died A.D. 361. [Constantius II.,
Flavius Valerius, P.C.]

(361.) JULIUS, Flavius Claudius, commonly known as
JULIUS THE APOTHEOSIS, nephew of Constantine the
Great by his half-brother Constantius, ruled the whole empire
for two years after Constantius. [Juliannus, Flavius Claudius, P.C.]

With Julian the family of Constantine ends.

(383.) JOVIANUS held the whole empire only three months.
[Joivianus, Flavius Claudius, P.C.]

(394.) VALENTINIANUS I., almost immediately on his
appointment to the empire, resigned the East to his brother
Valens. [Valentinianus I., Flavius, P.C.]

(394.) VALENS, emperor of the West, died in A.D. 378.
[Valens, Flavius, P.C.]

(378.) GRATIANUS, son of Valentinian I., succeeded
Valens in the East, but almost immediately resigned it to
his cousin Theodosius the Great, as a sop to keep the West, which he had held
from his father's death in A.D. 375. [Gratianus Augustus,
P.C.]

Theodosian 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. [Theodosii I.,
Flavius, P.C.]

(395.) ARCADIUS, the elder son of Theodosius, succeed-
ed his father in the East, and Honorius, the younger son, in
the West. [Arcadius, P.C.]

(408.) Arcadius, who reigned in the East, died in 408.
[Theodosius II., the Younger, son of Arcadius, succeeded
his father while yet in his childhood.]

(405.) FULGERTIA, daughter of Arcadius, succeeded her
brother Theodosius: she had devoted herself to a life of
religious celibacy, but upon her brother's death she chose as
her associate in the Eudokia, a Thracian, whose merit had
raised him from an humble station to high rank. She married
him under an agreement that she would remain a virgin.
She died before her husband.

(450.) MAMURRIUS may be classed with the Theodosian
family, his connection with which raised him to the empire.

Mamurrius, P.C. He died A.D. 457.

The history of the East during the eventful period (about
170 years) from the first division of the empire under Dios
The letter to the death of Marcellus has been gathered from many authors. Of the genealogy of the Roman Emperors, the preceding Augustus, and the succeeding Augustus, there have been contemporaries Lactantius [LACTANTIIUS, P. C.], or the author, whoever he was, of the book De Mortibus Principum Helvetica, Cod. 80. It relates chiefly or entirely to the reign of Honorius. The history of Zosimus, who lived apparently under Theodosius II., probably came down to his own time; but the extract portion extends only to a.d. 409. (ZOSIMUS, P. C.) This work has been gleaned from the Western Chroniclers, Marcellinus, Prosper of Aquitaine, Prosper Tyro, and Victor of Tours; from the poems of Claudian [CLAUDIANUS, P. C.]; and from the writings of the imperial, Julian, son of the Cæsar, of the emperors Theodores, Athanasius, Gregory Nazianzen, and Chrysostom. The History, after the time at which Eusebius closed his history, was written by Socrates [Socrates, P. C.], Sozomen, and Theodoret [SOZOMENUS, P. C.; THEODORETUS, P. C.], whose works extend from the time of Constantine to that of Theodosius II.; and by Evagrius [EVAQRIOUS, P. C.], whose work, designed as a sequel to those of the three writers just mentioned, comes down to near the close of the sixth century. These historians are valuable, not only from the importance of ecclesiastical affairs recorded in their time, but from the frequent notice of secular events. The history of the whole period is contained in the work of Gregory Nazianzen, and in the great work of Gibbon [GIBBON, E.], who marks the important changes in the European States, and in the Empire as well. The later Byzantine writers, who were of the time of Leo I. and Justinian, are, for the most part, valuable, having a great deal of biographical matter, and having written their history at a time when much was known of the events of the world.
acquisition of part of Armenia under Theodosius the Great, by
the western conquests of Belisarius and Narses, and by the ex-
ception of the Byzantine territory along the eastern and north-
ern 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
largely secure; it had been under the emperors who preceded
Justinian.

The principal historical authorities for the period from Leo the
Thracian to Phocas are Theophanes, Isidore, Zonaras, the
Chronicon Paschale, and the Byzantine history of Priscus. Certain
Malalas or Malalas, Michael Glycas, Joel, and the versifiers:
these several writers comprehend the whole period, with
the exception of Malalas, whose "Chronographia" ends
during the reign of Justin I. The works of Belisarius are related by Procopius, P. C.,
whose introductory chapters to his Bellum Vandalicum, Bellum Geticum or Gothicum, and Bellum Persicum, con-
tain 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
A.D. 553-558. The history of the Emperor Maurice (Historia Mauricius) is related by Theophylactus Simo-
catta; and the reign of Phocas is included in the work of
Nicophorus of Constantinople, De Rebus post Mauritius gratios.
The Ecclesiastical History of Surius, a contem-
porary of Malalas, continues the event of Nicophorus; of
that of Nicophorus Callisti, a writer of much later date, to
the accession of Heraclius. After the reign of Anastasius,
we lose the valuable assistance of Tillemont; but the whole
period is detailed in the works of Ducange, Gibbon, Smidson,
and Le Beau.

**Heraclian Dynasty.**

(610.) **Heraclius** was the son of Heraclius, governor
of Africa, dethroned 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 striking and inexplicable. The middle part of it
was characterized by brilliant and successful warlike expedi-
tions, by which the empire was saved from impending ruin.
The earlier part was characterized by inroads, and the latter part by
saudity and carelessness. ([Heraclius, P. C. and F. C. S.] He reigned above thirty years.

(641.) **Constantius III.** or more fully **Flavius Hera-
clius Constantius, or Novus Constantius** was the son of
Heraclius, the first wife Eudocia Fabia. The name of
Constantius 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
Marina. His second wife was a Tribune; she was an-
imous to make her son Heracleus (who had been, by his
father's will, made colleague with Constantine) sole occupant
of the throne.

(668.) **Heraclonas.** The death of Constantine III.
excited a revolt against the government of Martinus, who
ruled in the name of her son; and both she and Heracleonas
were compelled by Valentius or Valentine (who had forced
him to raise him to the title of Caesar) to admit Constantus, son
of Constantine III., to a share in the empire; and were soon
afterwards deposed, imprisoned, mutilated, and sent into exile,
where they died.

(641.) **Constantius II.** (Constant I., son of Constantine the
Great, 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,
unleashed considerable energy both in military and eccle-
siastical affairs. He was however violent and unfortunate:
her ascendency was so nearly drawn to the end of the
power of the Caliphate, were still further diminished by the
p. 217]; and his Italian dominions were shaken by religious troubles. His conquest of Egypt by his brother's
order (A.D. 661) made Constantius a prey to the horrors
of remorse. His palace at Constantinople became odious to
him; and this, combined perhaps with political reasons, led
him to leave the empire in 668, and the重任 of the
reign of the son of empire to Rome. The success of his
Italian warfare however made him give up this plan, and he
fixed his residence at Syracuse, where he was murdered, A.D. 668.

(668.) **Constantine IV. Pogonatus.** On the death of
the Eudamus, eldest son of Constant II., succeeded his
father. He had been left by his father governor of Con-
stantinople A.D. 668, and on the news of the assassina-
tion of Constantine his brother by a rebel or settler
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fixed his residence at Syracuse, where he was murdered, A.D. 668.
events which he relates. The Monothelite controversy is dis-
cussed largely by St. Maximus, one of the Greek fathers.

(711.) Philippicus Bardanes succeeded to the now vac-
ant throne. He patronized the Monothelites. His reign was short: he was deposed, blinded and imprisoned, A.D. 718, by Leo, son of Isaurian general, George Buraphus, who had rebelled in Asia Minor.

(712.) Anastasius II. (previously to his accession he was called Artemius) succeeded Philippicus. He patronized the orthodox faith. A profession to the Monothelites by the Isaurian general, Leo III., was anathematized A.D. 715 by the troparch he which he had sent to attack the Saracens in the port of Alexandria. [Anastasius II., P. C.]

(715.) Theophanes III. made some cessions of territory in Thrace to the Bulgarians. He was deposed (A.D. 718) by Leo, one of his officers, who commanded in Asia Minor. [Theophanes III., P. C.]

I. Byzantine 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. surmamed Copronymus, because he was defied with the title of Caesar by Artabazes, 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 every kind of treachery, and by some a detected impostor of the so-called orthodox party; but the Icono-
clasts, whom he favoured, revered him as a saint. The re-
volt of his brother-in-law Attacatas, or Attavases, or Arta-
catas, who at the commencement of his reign disputed the crown with him, and was apparently supported by the image-
worshiping party, was near proving fatal to him; but in the end (A.D. 745) he recovered Constantinople, which Attav-
catas had occupied, and deposed that usurper. Constantine died A.D. 775, and was succeeded by his son Leo.

(775.) Leo IV., surmamed Chazares, which name he de-
rived from his mother Irene, who was a daughter of the Czar Chazares, of the Volga. [Tzarae—Chazares, P. C., vol. xxiv. 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.]

I. Byzantine dynasty.

(780.) Constantine VI., sometimes called Porphyro-
gerius, or more accurately Porphyrogennetos, 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 his minority became a source of irritation to the patriarch Photius, and he was accused of avarice, perjury, and blindness, if not of 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 reuniting the Eastern and Western Churches, by marriage of Irene to Charlemagne of the Volga. [Tzarae—Chazares, P. C., vol. xxiv. 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.

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the Vota Imperatorum Recensiorum of Georgius Monachus, and in the Regia of Generis: 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.

 Macedonian Dynasty.

(867.) Basilii I. Maced, or the Macedonians, an extraordinary man, the son of a small landowner in Macedonia or Thrace, rose to the low condition of slave 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 world to a warlike sect, which, for 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 conquered them. He died a.d. 886, and was succeeded by his son Leo. [Basilii the Macedonian, P. C.]

(886.) Leo VI., named Philosopher, 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 were noticed elsewhere. [Leo VI., P. C. and Romanus II.]

(911.) Constantinus VII. Porphyrogennetos, or Porphyrogenitus, succeeded his father while yet a child of six years. He had for his first colleague (in which Nicaea, the seat of Basilii I., 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., named Lecapenus or Lacapenus (Benedict), was assumed a.d. 919, and successively raised his three sons, Christophorus in a.d. 919, and Stephanus, and Constantine VIII., in a.d. 928, to the title at least of emperor. Romanus engaged in the suppression of the abbeys and in Constantinople 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 VIII. had recovered the possession of Asia Minor. He died in his prime, a man of measure, but somewhat infirm of body. He was a man of considerable importance [Byzantine Historiciens, P. C.] and include: 1. The life of his grand-father Basil the Macedonian, incorporated in the Continuation of the Chronographia of Michael the Cornutus. 2. The. Homilies. 3. The description of the themes or military provinces of the empire. 4. De Administrando Imperio, 'On the administration of the Empire,' written for the instruction of Romanus and successors of Constantine [says Dr. Plummer 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 subject or his neighbours, would be little more than vagueness, error, or complete darkness. 5. De sermoneibus Byzantinorum,'On the Ceremonies of the Byzantine Court,' a detailed account of the observances of royalty and administration at that time. We owe also to Constantine various valuable Collectanea or compilations, especially De Legationibus, on the Embassies of the Romans to other nations and of other nations to them; which contains numerous valuable Excerpta from Polybius and other history-books. Many of these Collected works are for continental medicine and on agriculture. [Geoponika, P. C.]

(959.) Romanus II. [Romanus II., P. C.] distinguished as Junior, the Younger, sometimes as Fixus, the Boy, reigned only a short time, a.d. 963 of poison administered to him by his wife Theophano.

(963.) Basilii II. and Constantine IX., or as some call him (not recognizing the son of Romanus Lecapenus) called the Colleoni the Younger, aged respectively nine and two years, were nominally the successors of their father Romanus II.; but their predilect mother and guardian Theophano married Nicephorus, a valiant and successful general, and raised him, nominally to a share, but actually to the sole possession of the empire.

(963.) Nicephorus II. Phocas exhibited as a sovereign the same military skill and valour which he had previously shown. At the end of a.d. 967, he repaired to the scene of warfare; 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 invaded. To the west he was less signal and complete: he could only dispute with the Saracens and with the Western Emperor (to the possession of the southern extremity of Italy and of the island of Sicily. But wars against the Bulgarians, already conquered by Nicephorus made him unpopular, and the infamous Theophano, who was weary of him, conspired with her paramour Johannes or John Zimisces to assassinate him. He was murdered a.d. 969.

(969.) Johannes I. Zimiskes or Timiskes (969-976) succeeded to the sovereignty of Nicephorus; and, like Flus, was distinguished by warlike pre-eminence, both as a subject and an emperor. One of his first acts was to bring the guilty Theophano. A rebellion, raised by Bards Phocas, was soon suppressed; and Johannes 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 to the empire, though only for a short time, its long lost possessions in Mesopotamia, and extended the conquests of Nicephorus to the Adriatic. The Lombard king's career was cut short by poison administered by some of his own courtiers, after a reign of only six years.

From a.d. 975 begins the actual reign of Basil II. [Basilii II.], or the Imperial period. He exercised the full 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 regency of Basil. Indeed, when the inevitable death of Bards Sclerus, was with much difficulty suppressed, and the conquest of Byzantine Italy and Sicily by Otho or the Saracens was prevented chiefly by their wars with each other, the regency which we have described as the regency of P. C. Constantine was in reality a 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 kingdom he restored the long lost frontier of the lower Danube, as far up as Sirmium: he defeated the Caucasian mountaineers and protected the Byzantine part of Armenia from invasion: and he was preparing for the complete conquest of Sicily and Byzantion Italy when he died a.d. 1025. Constantine survived his brother only three years; and his death a.d. 1028 cleared the way for a commonly reputed potentiate, the dynasty of the Palaeologus. (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 Palaeologus.

The Macedonian period of a hundred and sixty years was one of apparent, if not of real revival. The frontiers of the empire had been extended in the north from the defiles of Mount Imaena 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 royal powers, the Caliphate [Caliph, P. C.] and the Bulgarian kingdom, rendered their prowess effectual for the revival of Byzantine greatness. The literary taste and acquisitions of Leo VI. and Constantine VII. led to a revival of literature; and several valuable writers belong to this period. The history of this area is contained in Zonaras [Zonaras, Joanna, P. C.], Cedrenus, Glycas, Ephræmium, and Constantinus Manasses; the anonymous Chronicle of Gerard of Thessalonica, the Historia Arabica, the Chronicle of John Skylitzes (sometimes called, but on insufficient ground, Leonicus), Symeon Magister, Georgius Monachus, Leo Grammaticus, and Genesius. Of these authorities Genesius ends with the death of Basil II. in a.d. 1025; Leo Grammaticus, with the death of Romanus I. Lecapenus (a.d. 948 or 949), a few years after his deposition; and the continuator of Theophanes and Symeon Magister, with the early part of the reign of Nicephorus Phocas, and the life of Ioannes Zimisces, who lived in the reign of Basil II., and whose history comprehends the reigns of Romanus II., Nicephorus Phocas, and Johannes Zimisces (a.d. 959-975). [Byzantine His-
Hundred half. He Theodora, Comnena. Romans, after a short reign. in which his troops were defeated by the Turks, and in which he was assassinated by his wife and her paramour Michael, when she elevated to the throne. [Romanus III., P. C.] (1034.) Michael IV. Filippagos, the Filiopagian, reigned meanly and miserably for more than seven years and a half. (1041.) Michael V. Calaphates or Calaphatta (i.e. a reformer of vessels), a name derived from the occupation of his father, Manuel, who, in 1028, had married Zoe. 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 deposed Michael, depriving him of his eyes, after he had reigned little more than a year. (1042.) Zoe and Theodore reigned jointly for a few months, when Zoe married and raised to partnership in the empire. (1042.) Constantine X., or as some reckon Constantine IX., succeeded, from his vault, Mornachus, the Bishop Comnena. This emperor had to represent a revolt in Cyprus; to contend with the Turks on land and sea, and to defend his throne from his rival, Georgius Manasses, the greatest of the Byzantine warriors of his day, who being driven by injustice to revolt, advanced against Constantinople and defeated the imperial forces, 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 Constantine X. and his people, and also 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. Zoe died a.d. 1050 and Constantine a.d. 1054. Theodore 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 armed warrior named Michael. (1056.) Michael VI. Stratocrates, thus succeeded to the empire, which he held for about a year, when he was deposed. Theodore had died a few days after their marriage. The short reign of Michael VI. was troubled by the unsuccessful revolt of Theodoreus, a cousin of the late emperor Constantine X. (1057.) Isaacus I. Comnenus, whose successful revolt had deposed Michael VI., was reigning about a year after his death, induced by his failing health to resign the empire. The succession was offered first to Johnnes Comnenus, the Emperor's brother, who declined it; and then to Constantine Ducas. (1069.) Constantine XI. (or X.), succeeded Ducas reigned seven years, in which the empire was assailed by the Hungarians and other enemies on the side of the Danube. On his death the throne was occupied by his son Constantine, who was soon induced by his failing health to resign the throne. The succession was offered first to Johnnes Comnenus, the Emperor's brother, who declined it; and then to Constantine Ducas. (1069.) Michael VII. Stratocrates, 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). [Seleucides, P. C.] On his release, he attempted to recover his throne, but was defeated, taken prisoner, and deprived of his eyes with such cruelty, that he died a few days after. [Romanus IV., P.C.] Eudocia had, during the interval of his imprisonment, renewed her suitor Michael VII. then assumed the exercise of the sovereign power: but by his cowardice he incurred the contempt of his subjects, and he was, with his brothers, deposed by the rebel Niketas Botaniotes, who, as the representative of the deceased emperor, had succeeded to the throne of the family of Ducas with Michael VII. It occupied the Byzantine throne less than twenty years. (1072.) Nicholas III. Botaniotes [Nicaeophilos III., P. C.] had revolted against Michael at the same time as his namesake. Alexius Comnenus, the general of Botaniotes, defeated Bryennius, and compelled him to surrender, but shortly afterwards revolted in his own account, and assumed (a.d. 1081) in defence of Botaniotes 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 ascended 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 middle of the eleventh century, and 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 first place, the Normans took the first vision in 1071, and the second, in 1078, by the Saracens, driven to 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 Seljukian dynasty [Seljukides, P. C.; Turkes, Turks, 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 which the capital was fixed at Nicea, or Nicé, in Bithynia, about a hundred miles to the north 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 Byzantine army. The small degree of the recovery, the incursions of the Turks, and the West of Europe; and led the latter to regard with comparative indifference the threatening progress of revived Mohammedanism under the protection of the Turkish power. For the history of the persons we have still the chronicles already enumerated; but Cedrenus ends with the year 1058, and Constantine Manasses with a.d. 1081. To these we may add Joannes Scylitzes Cypriotes, the fragments of whose history refer to the period from a.d. 1094 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 Comnenus, daughter of Alexius, and wife of this Nicophorus Bryennius, who has in her Alexia* given the history of her father's life. Comnenian Dynasty. (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, taking Adrianople, invaded the empire. The facility 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 inland and mountainous districts. He died a.d. 1118. [Alexius Comnenus I., P. C.; Crusades, P. C.] (1118.) Joannes II. Comnenus, or as he is commonly termed Calo-Joannes. Eudocia* son-in-law of Alexius, given him 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 rain attempt to dispose him of the throne 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, and the conquest of Asia. Manuel I. Komnenus, born, in character, a singular resemblance to our own Richard I. He continued the warlike exertions which his father had made, and against the same enemies: but in an interval of a few years, a large part of the wealth and the empire, which had been accumulated during a century, was dissipated. He was succeeded on his death the throne 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 the hands of Manuel I., father of Isaac Comnenus, who was a younger son of Alexius I.
(1180.) ANDROMAICA I. CONNENIA then usurped the throne, but after a reign of two years was murdered by the people of Constantinople. [ANDROMAICA COMMENIA, F. C.] In him the male line of the Comneni ends. He was succeeded by Isaac Angelus, whom he attempted to put to death, and consequently he fled to Greece, beyond the borders of the empire. [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 man of the imperial race, and the loss of Thessaly, which, indeed, was taken under Richard I. of England and given to Guy of Lusignian, the expelled King of Jerusalem; and of the territory between the Haemus and the Danube, which was lost by the revolt of the Bulgarians, under whom the Slavonic 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.

(1185.) ALEXIUS OF ALEXIUS III. ANGELUS OF 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 Comneni in Europe, was dethroned by Alexios, son of Isaac, who was assisted by the Crusaders of the Fourth Crusade.

(1203.) ISAAC II., the deposed and blinded emperor, and his son ALEXIUS OF ALEXIUS IV. ANGELUS, were, in consequence of this revolution, placed on the throne; but a revolt of the people, excited by Alexios, drove them from the capital and to the position and to the extinction of Alexius IV., whom Isaac II. soon followed to the grave. The branch family of the Angelis, and indeed the dynasty of the Comneni, and the hopes of the universe, were now extinguished.

(1204.) ALEXIUS OF ALEXIUS V. Ducas, surnamed Murzilli, is, of the SHAGGY EYEBROWS, the successful revolter, succeeded to the throne (which a shadow of an emperor, Nicholas Comnenus, had for an instant occupied), but was at once besieged, and after a few months taken prisoner or put to death by the Crusaders, who captured Constantinople, divided a considerable part of the conquered territory into several Latin principalities, and established a line of Latin princes on the throne of the Eastern Empire. [BALDWIN I., EMPEROR OF CONSTANTINOPLE, F. C.; DANDELO, EMIRIO, F. C.]

The period from the accession of Alexius I. to the capture of Constantinople by the Latins is one of great vicissitudes. 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 ability and valour of his successors John the Second and Manuel I. extended the limits of the empire without materially increasing its strength. From the death of Manuel we have a period of rapid conquest, but a period of decline, the Seljuk Turks, the Scandinavians, and the crusaders, grinding down the empire, by covering a considerable part of what they had lost in Asia Minor; until the empire was limited to Thrace, Macedonia, Epirus, Greece, and its islands (of which, however, Crete was lost by Manuel in 1204), and the eastern portion of Asia Minor, especially on the coast. This diminished territory a considerable part fell with the capital into 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 'Asia Minor' (TREBIZOND, EMPIRE OF, F. C.); and two other fragments were detached in the west to form the despots of Epirus and Thessaly, the formation of which, though sometimes referred to by the partisans of the Fourth Crusade, was never again incorporated with it. [ALBANIA, F. C.]

The remainder of the independent portion of the Greek empire, the rulers of which assumed the title of emperor, was divided into the petty states of Nicea, or Nice, in Asia Minor, and afterward recovered Constantinople, will be regarded as the connecting link between the overthrown and the restored Greek empire. All the transactions of the year 1204 are included in the history of the empire of Trebizond, the sequel of which, though sometimes referred to by the partisans of the Fourth Crusade, was never again incorporated with the empire of Trebizond.

The history of Alexius I. is contained in Eparnes and Gyraena; both of whom conclude their Annals with his death, in the short life of Joel, in the Journal of Eastern History, and in the Pantheon of Eparnes, which becomes from his reign now more fall and important; and especially in the Alexian of his daughter Anna Comnenus. [ANNA COMNENUS, F. C.] The history of the empire of Trebizond is narrated by the Alexian of Anna Comnenus, whom the latter ends with a.d. 1204; and in the histories of Cinnamus, which comprehends the reign of John III. and nearly the whole of that of Manuel I.; and of Nicetas Atticamitas, or Nicetas Chondrias, which extends from the death of Alexius I. to the death of Baldwin I., first Latin emperor, A.D. 1208. The Latin authorities, Galliemus Tyrrenus (William of Tyre), and the others contained in the Gesta Dei per Francos, or Chronicles of France, probably in the hands of the pope, at the time of the collection, are enumerated in Michaud's Bibliographie des Chroniques. [CRUSADES, F. C.]

(1180.) BALDWIN I. [BALDWIN I. F. C.], Count of Flanders and Hainault, was appointed Emperor by the victorious Crusaders, but was, after a year's reign, captured in battle by the revolted population of Thuroe and the Bulgarians in the Via Graecorum, and died a.d. 1182. [Baldwin I., EMPEROR OF CONSTANTINOPLE, F. C.]

(1219.) PETRUS DE COUTEIET, PETER OF COUTEY, Count of Auvergne, ascended the throne in conjunction with and in the right of his wife ISLANDIS OF YOLANDA, sister of Baldwin and Henry. He never assumed the title of emperor, but was taken prisoner on his way thither by the despots of Epirus, and died in captivity a.d. 1219. Yolanda died soon after. [1219, or, according to others, 1221.] ROBERTS, or ROBERT C., son of Peter of Courtenay, succeeded to the throne. He was, some time after, expelled by his own subjects, and died a.d. 1228. [Baldwin II., EMPEROR OF CONSTANTINOPLE, F. C.]

(1219.) ISAAC II. ANGELUS OF COMNENUS, F. C.]

The Greek emperors will be noticed when speaking of the authorities for the contemporary Greek emperors of Nice.

Greek Emperors of Nice or Nice.

(1204.) THEODORUS II. LASCARIS [THEODORUS LASCARIS, F. C.], in an active reign of eighteen years, re-established the Eastern Empire in a portion of its ancient Asiatic territory, of which Nice was made the capital. He had married Anna, daughter of Alexius III. Angelus or Comnenus.

(1229.) IOANNES III. DUCAS VATATZES succeeded Theodore Lascaris by virtue of his marriage with Irene, daughter of Theodore Lascaris, or rather by his merit, which induced him to assume the crown. He reigned for nearly thirty years, and extended his dominions, and ruled for another forty years, and recovered a portion of territory from the Greek empire of Trebizond. He died a.d. 1255. [THEODORUS 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 Palaeologoi, and first of the restored Greek emperors of Constantinople.

The historians of this period are Georgius Acropolita, whose history just comprehends the period when the seat of the empire passed to Nice (a.d. 1204); Nicetas Gregoras, whose history begins at the same point but comes down later than that of Acropolita; and the Metrical Chronicle of Ephraemius, which ends with the recapture of Constantinople a.d. 1261. The history of Nicetas Gregoras contains only a year or two after the capture of Constantinople by the Latins. [RESTITUTION OF THE WESTERN EMPIRE OR GREEK EMPIRE TO CONSTANTINOPLE, F. C.]

(1905.) MICHAEL VIII., PALAEOLOGUS, or more fully PALAEOLOGUS COMMENOS, great-grandson, through his mother, of Alexius III. Comnenus, and by the death of his uncle, boy Emperor Ioannes IV. In 1261 Constantinople was recovered by Alexius Stratzycopulos, and Michael restored the
seat of government to that city. But if the Latins were expelled, the empire never recovered the extent which it had before the Latin conquest. It had been dismembered on the east and west by the empire of Trebizond and the despotate of Epirus; though the despot of Epirus had, in the reign of Joannes Vatatzes, recognised that princes as his lord paramount, personally and in person, and usually warred under his command. His power threatened the supremacy of the Latin emperors, and 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 suburb of Galata. His guilt in blinding and exiling his unhappy compatriot 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 hypothetical 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 reconquer the Latin throne of Constantinople. Michael died A.D. 1283.

(1283.) ANDRONICUS III. PALAEOLOGUS, or more fully DUXIS COMMINUS ANGELOS PALAEOLOGUS, distinguished as the Younger, after the death of his father Michael VIII. and reversing the policy which Michael had pursued, dissolved the hollow union of the churches and was excommunicated by the Pope (A.D. 1287). His reign was marked by the establishment in Asia Minor (about A.D. 1300) of the rising monarchy of the Osmanli, or Ottoman Turks, so called from Othman their founder, in place of the declining kingdom of the Seljuks, which had fallen overthrown by the Crusaders in the thirteenth century to the alliance than by Latin aid. Ananias Palaeologus succeeded to the empire the whole of the Moors. He died A.D. 1425.

(1425.) JOANNE VII. PALAEOLOGUS, surnamed PORSYHOGENETES or PORFYRIONGENES sometimes called Joannes Palaeologus II., 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. 1439, to be present at which, he visited Italy. He ruled personally in Constantinople; the fragments of the empire in the Moors and in the Tauric Chersonesus, the Crimans, were ruled by his brothers as vassals. His reign precipitated the downfall of the empire at the end of the fourteenth century. The Greek church disgraced his subjects; the allies secured by it were defeated by the Turks at Vatra A.D. 1444 (MURAD II., P.C.), and the Turks attacked the Moors and allowed its ruler, Usman, the brother of Sultan Murad, to pay the condition of paying tribute. Joannes VII. died A.D. 1448.

(1448.) CONSTANTINE XIII. (some call him XI.) PALAEOLOGUS, surnamed Dragasek, last emperor of the East, succeeded his brother John Palaeologus (1342-1444; 1448) in three sessions in the Moors to his brothers Demetrios and Thomas. His brief reign was ended by the capture of Constantinople by the Turkish Sultan Mahomet II. A.D. 1453. Constantin 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 Latin. Demetrios and Thomas Palaeologus were expelled from the Moors in or soon after A.D. 1449; the empire of Trebizond was extinguished in A.D. 1464, and all the value of Chersonese [Scandza-Bog, P.C.], who died a fugitive in A.D. 1467, which was, did not prove the final subjugation of Epirus. [MAHOMET II. P.C.]

Thus were extinguished the name and the last remains of the Palaeologae. From its reputed foundation by Romulus it had subsisted for twenty-two centuries; from the settlement of the empire by Augustus nearly fifteen centuries; a duration as yet unequalled in the history of the world, unless it be in China. From the account of these emperors and their times, the first Constantin to the capture of the city of the time of the last Constantine, that magnificent city was never in the possession of an enemy except during the half century of Latin occupation. The declarations of Pope Pius II. that papal power was hardly interrupted though the seat of empire was temporarily fixed at Nice. The despotical 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 amidst frequent disasters a remarkable cohesiveness and unity, until the Latin conquest in A.D. 1204. But as from the same deep-seated conviction of the necessity of the recovery generally fell short of its predecessors. During the temporary fluctuation of the condition of the empire, the tide of its greatness and prosperity was gradually ebbing. The spirit of the time was not destitute of the characters of the 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 Tzimisces, 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 history of Lazars and the Varmados never made 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 modern day. Byzantium (or Constantinople) was the Roman in Europe, the last seat of the Byzantine Empire (Bumill-i, P. C.), and Rome or Ruma, in Asia Minor, the seat of the empire of Trebizond.

Of the last period of the empire is contained in the 'Roman History,' or rather 'Romaic History,' of Nicephorus Gregoras (from A.D. 1204 to 1351); in the history of the emperors (from Michael Palaeologus to Andronicus the elder), by George Phocas (1369) by George Pamphilius; of the Emperor Johannes Cantacuzenus, containing the account of his own time; in the 'Historia Byzantina' of Ducau, especially including the reigns of the two Johns, V. and VI., and their brothers, to 1462; in the 'Geschichte der Georgii Phocas or Phrantas, from the recovery of Constantine in 1261 to A.D. 1477; and in the History of the Turks by Laoncous Chalcedonidales. We do not mention the contemporary Latin historians whose works include notices of Byzantine history; and much of the recent historians we shall only mention Ducange, Le Beau, with his continuator Amelin, 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 Emperors, and of his Decline and Empire, with all its admirable qualities, is unsatisfactory as a history of the Eastern Empire. The unity which he has given to his episodes has destroyed that of his main subject; and his readers feel the different parts of his composition, and 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 Moguls, 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.

ROMANELLI, GIOVANNI FRANCESCO, was born at Viterbo in 1617. He studied a short time with Demenichino, but he is chiefly known as the scholar of Pietro da Cortona; and he was one of the principal hangers on of Borghese, who has inherited a name as a rival to 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 Scala, is a testament of those good qualities with which his associates in the school. Romanelli showed more delicacy of execution, but considerably less power than Cortona. There is a Presentation in the Tempio in one of the chapels of St. Peter's, which he might have been allowed to be done at the church of the Certo. He was twice in Paris with his patron Cardinal Barberini, and he died at Viterbo in 1663, 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, Vite de' Pittori &c. Moderni; Lanz, Storia Pittorica, &c.)

ROMBERG, ANDREAS and BERNHARD, cousins, 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 1767; Bernhard in 1770. Both held appointments in the royal chapel of the Elector of Cologne, at Bonn, about the year 1790. The younger was distinguished by his superior performance 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 quitted that city, 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 was appointed an instructor in the royal chapel at Berlin. Andreas in the meantime turned his attention more exclusively to composition, and produced four operettas; he also set Schiller's 'Ode to Music.' For the church music of modern day, Roumelin (from Roumania) composed 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;' he also wrote other things, which are now lost, in every part of Europe. He also produced two full operas, 'Die Grosmuth des Scipio;' ('The Magnanimity of Scipio'), and 'Die Rolinen von Paluzzi.' ('The Ruins of Paluzzi'). In his later part of life he published his 'Italian;' and, if an opinion of the work may be formed from a pianoforte arrangement, it seems to be an opera that might be successfully adapted to one of our musical theatres.

Bernard was perhaps less known in B or Annales, but his 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 embarrassed circumstances, a concert for their benefit was generously got up in London by the Philharmonic Society, which was attended by twenty thousand persons. Bernhard was one of the principal presiders. Bernhard had pointed 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 1820, and died there in 1831, of consumption. He visited this country, and gave a concert, by which he was no longer so much the scholar, or the composer, or the pianoforte player as he was the composer of the 'Emperor,' and the violoncello part of the 'Incidental Music' of Rossini's 'William Tell.' He had composed a great many operas, oratorios, or sacrid pieces, and other works in every style of composition.
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 bishop of Constantinople before Methodius, who was bishop in the early part of the fourth century, are especially doubtful.

In the fourth century the succession is perplexed by the fact occasioned by the Arian controversy; and from the sixth century, owing to the rise of the schism, there has been a double succession in the patriarchates of Alexandria and Antioch (the two names which are sometimes, from their situation, the Coptic patriarchs and Antioch: and the perplexity in the patriarchates 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 the East and the greater part of Syria, by the first crusaders, and the capture of Constantinople in the fourth crusade, the division made was still greater by the appointment of Latin patriarchs at Antioch, Jerusalem, and Constantinople. In order to prevent mistakes, 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 orthodoxy or heterodoxy 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, in most cases, continued in use in English books; a few cases in which the names have been Anglicized are indicated in italics, as the reader will easily recognize John in Joannes, Peter in Petrus, Mark in Marcus, Theodore in Theodorus, &c.


When two years not consecutive are assigned as the date of accession, it must be understood that the date of accession is not agreed upon, but that it occurred either in the years marked, 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 exact date of accession is unknown. A, subjoined to a name, denotes Arius; M, Monothelite; C., Iconoclast; J., Jacobite, or Monophysite; H, Heretic (reputed), without reference to the nature of his heresy.

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Rome

Alexandria

Antioch

Constantinople

Jerusalem

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**ALABIANA**

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**ROSES, RIGIDITY OF. [RIGIDITY OF ROSES, P.C.S.]**

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**ROSALIINA. [FORAMINTERS, P.C.S.]**

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**ROSELLI, COSIMO, a celebrated old Florentine painter, was born at Florence, according to Gory, in 1439. There are few of his works remaining; the principal ones are those in the convent of Sant'Ambrogio at Florence, painted in 1456, according to an inscription upon it by Rumohr, when Cosimo cannot have been more than eighteen years of age; according to the above date, it was impossible that he was painted in his youth. And Rumohr observes that Cosimo, in the commencement of his career, followed the path which was opened by Angelico da Fiesole and Masaccio; but 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, inanimate, and ugly manner. The fresco represents the transportation of a miraculously worked chalice from the church of Sant'Ambrogio to the episcopal palace; the abbots and nuns 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 Latino for his series of old Florentine paintings, and there is a group of it in Lestril's 'Etruria Pittoresca.'

Cosimo was one of the painters invited by Pope Sixtus IV. to Rome to paint the Cappella Sistina, built in 1473, by Baccio d'Angelo (Baccio della Porta), for that pope. Cosimo's paintings in this chapel are still in good preservation; they 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 worshipping 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 Piero di Cosimo, afterwards the master of Andrea del Sarto. These works were purchased 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 had, therefore, knowing his weakness in composition and design, painted his picture very high in colour, and used plenty of ultramarine and gold, counting upon attracting the pope's fancy by his gaudy display. When the pictures were all uncovered, his however was laughed at Cosimo for his peculiarities. 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 1606: Vasari says he was sixty-eight years old when he died; if therefore he were born in 1439, 1507 may have been the year of his death. He was the master of Frà Bartolomeo.


**ROSELLUNI, IPPOLITO, Cavaliere, was born August 13, 1800, at Pisa. 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 Serviant 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 after wards distinguished himself, and the mercantile career was wholly abandoned. In 1821 he finished his university studies in Pisa, 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 discov-
ery he was an ardent advocate. When Champollion, in
1826, for the further development of his system, examined the Egyptian monuments at Bologna, in Italy, 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 pub-
lished in the same year 'Lettere, oramai池a finita di un disegno
monumentale dell' Egitto di Nubia,' 8vo., with four volumes of
text, 1823-41; the second, 'Tavoletta M. C.,' contains the civil
monuments, 'Monumenti Civi,' in 155 plates, four volumes of
text, 1834-56; and the third, 'Tavole MI. C. S.,' the civil
worship, 'Monumenti del Culto,' in 86 plates, with one volume
of text, 1844. An index of the whole work is said to be in
preparation by Rosellini's pupil Giuseppe Bardelli, who pub-
lished a continuation of his life at Florence in 1849. 'Biogra-
phia del Professore Ippolito Rosellini,' of which an abstract
appeared in the 'Allgemeine Zeitung' and in the 'Kunst-
blatt,' in the following year; the latter notice has been used in
the preparation of the index. Rosellini be-
quessed 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
Egiziotico,' Hieroglyphic Dictionary, with several thou-
sand names.

ROSIAN is a small tract, and a part of that immense
region of Oriental Asia which is called Persia, or Independent
Turkistan. It lies between 57° and 58° 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
irregular region, and in some parts the mountains are high,
between which are wide and inaccessible deserts; in other
ranges which constitute the western declivity of the Boler
Tagh, and surround the elevated table-land of Pamir. Along
its southern boundary runs the river Oxus, which in these
mountains is divided into several streams, which unite to form
the Oxus, and enter the Caspian Sea. The mulb-
erry-tree is much cultivated, and the fruit is used for making
flour. Horses are not numerous: the camel with two hunches
is the principal beast of burden. Cattle and sheep, both of
the usual description, constitute the principal stock. The in-
habitants, whose number is stated not to exceed a thousand
families, speak a peculiar language. The sovereignty of
this country is dependent on the Khan of Kandah, but this
dependence is only nominal.

(Wood, Journey to the Source of the River Oxus.)

ROSMINI, CARLO DE', born in 1758 at Roveredo, in
the Italian Tyrol, studied first at Innsbruck, and then in
his native town, where he began early to show his aptitude for
literary composition by writing several disquisitions on poetry.
He afterwards removed to Ferrara, where he published in
1789 a 'De Filis Carminum Et Odiorum.' In 1793 were
added a letter by Vannetti on the style and the language
of Ovid, and a parallel between the Orphus of Ovid and the
same character in Virgil. This work obtained for Rosmini
the most signal honours in the Florentine academy. He next wrote: 'Della Vita di L. Anneo Seneca libri quatro,' Roveredo, 1793. In 1801 he
wrote an account of Vittorino da Feltre, a celebrated precep-
tor of the fifteenth century, and of his system of education:
'Idea dell' ottimo Frettore nella Vite e Disciplina di Vittori-
no da Feltre e de' suoi Disciplori.' This book may be called
a treatise on pedagogy, as well as the next work published by
Rosmini on Guarino Veronese, a contemporary of Vittorino
da Feltre, and upon his school: 'Vite e Disciplina di Guarino
Veronese e de' suoi Disciplori,' 3 vols. 8vo., Brescia, 1805-6.
In 1808 Rosmini published an elaborate biography of 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: 'Della Istoria intorno alle
Milici Italiane del Granduca D. Gian Jacopo Trivulzio detto il Magnifico Libri XV,' 3 vols. 4to., 1811. This work was
accompanied with handsome engravings and valuable documents. The last work of Rosmini was his history of Milan: 'Dell' Istoria
di Milano Libri XVIII.' This history embraces the period from
the time of the end of the principality of the Visconti to the
year 1532, 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 the Empress Theresa in 1740, which continuation is still
inedited. Rosmini ranks among the most lucid of Italian
biographers of our times. He died at Milan in 1827. (Tipaldo, Biografia degli Italiani illustri.)
ROSSI, ROSSO DE, or IL ROSSO, called in France, Maitre Roux, a celebrated Florentine painter, was born in Florence in 1496. He studied the works of Michael Angelo, and, being impressed with his genius, he is said to have exclaimed, "I will be his equal." He executed several works in various cities of Italy, but his paintings are not numerous in Italy, as he passed the best portion of his career from about 1530 in the service of Francis I. at Fontainebleau, where he was the object of great esteem, and the superintendent of the palace, with a princely allowance, and a house in Paris, given to him by Francis. In the year 1541, however, while still at Fontainebleau, a few hundred ducats were stolen from him, and those he had been prevented from returning by a declaration of the theft, who was put to the torture and was declared to be innocent. Rosso's sorrow for what had happened, and the doubts of Pellegrino and his friends together, annoyed him to the lowest degree. After the discovery of the theft, and grief of Francis and his own pupils and assistants. He is said to have been called II Rosso on account of his red hair: he was remarkable for his large and handsome person and general accomplishments and acquisitions. Rosso was the boldest painter that had appeared in Italy up to the time of Vasari. Very few of his works were left at Fontainebleau; many of them were destroyed by his successor Primaticcio. Many of his works have been engraved.

(Vasari, Vita de' Pictori, etc.; Lettere Pittoriche; D'Argenville, Vies des Peintres.)

HANS FELIX, R.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 Rossal was apprenticed very early to a surgeon of the city, and after he had served his time, as a journeyman, at eighteen shillings per week; but being employed by his master to correct some work on which Locotta'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 longing for praise, impossible for him to remain in his then subordinate situation, and he determined upon trying his fortune 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;—The Marquis of Granby, in the nave; Captain Faulkner and Lord Heathfield, in the south transept; and Captains Mosses and Roo, and Lord Rodney, in the north transept. The principal of these are those to Lord Cornwallis, Heathfield, and Lord Rodney, now at last visible in the last finish of the mausoleum, which, except the second, are groups of three or more figures of the heroic size. That to Lord Cornwallis is placed opposite a Flaxman's monument to Nelson, and is in a similar style of composition, but much more vigorous and spirited. The Marquis, as a Knight of the Garter, on a pedestal forming the apex; below are three allegorical figures—Britain, and the explorations of the Bosphorus and Ganges, representing the British Empire in the East; and the Ganges has much grandeur of form. Lord Heathfield is a single statue, represented in his regimentals; on the pedestal is an altar-piece of Victory descending from a castellated rock to crown a warrior on the sea-shore with laurel. Against the same pier is the monument to Captain Faulkner, R.N., who was killed on board the Blanche frigate in 1755: Neptune, seated on a rock, is in the act of catching the naked figure of a dying sailor. Victory is abstract, and is crowned 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 J. [Companion to St. Paul's Cathedral.]

BOTTECK, KAHL WENCESLAUS ROLODEK, VON, was born on the 18th of June, 1776, at Freiburg im Breisgau, which now belongs to the Grand Duchy of Baden, but at that time was subject to the House of Austria. His father, Anton Roateck, was sent to the University of Freiburg, II, under the name Roateck von Rotteck, on account of the eminent services which he had done to his country and the emperor as perpetual dean of the Medical Faculty in the University of Freiburg, and as one of the councilors in the board of administration of Austrian S. His mother, Charlotte Pfotr d'Oegon, a native of Remiremont in Lorraine, is described as a lady of rare virtue and accomplishments. Karl von Rotteck received a very careful education, and as early as 1790 was admitted a student in the faculty of law in the university of his native town. He took the degree of doctor of civil law in 1793, and in 1798 was admitted to the bar. He devoted all his spare time towards the accomplishment of a great historical work, which secured him a high rank among the historians of Europe. Of his 'Allgemeine Weltgeschichte,' ('Universal History') the first volume was published in 1811, but it was only finished in 1897. Germany having recovered its independence through the treaties of 1814 and 1816, and political liberty having been promised to its inhabitants, Rotteck's law was rejected by the states; of Germany, as an object of his particular attention; and desiring to propagate his ideas, gave up his chair of history, and petitioned for that of politics and the law of nations in the same university, which he obtained in 1818. On those subjects he published a great number of works and memoirs as well as articles in the leading liberal periodicals of Germany, and the princes of Germany being then active in checking the rising liberal spirit of the nation, he obtained great popularity. In 1836, on his taking his university as their representative in the first chamber of the States of Baden. In the same year appeared his 'Ideen über Landstände,' ('Idea on Representative Bodies:') a work discussed and attacked by the German historians, and especially distinguished by great ability and an elegant and attractive style, for which he is remarkable among the German historians and publicists. Some time afterwards he wrote a work on standing armies, the danger of which he endeavoured to show, and a history of the States and Cities of States of Baden, which were well received by the people, but made him many enemies among the friends of the old state of things. Thus, lecturing in the university, propagating his liberal views through countless minor productions, and representing Freiburg in the states, he continued till 1830. The outbreak of the French revolution in 1830 gave fresh vigour to his activity; he became the leading spirit of the party among the liberal periodicals of Germany, several of which were founded by him; and giving up his seat in the first chamber of the states as member for the university, he accepted the membership for the city of Freiburg, which he placed him in the second chamber, among the representatives of the people. At the head of those members who by their unremittent zeal in developing political freedom in Baden set an example to all Germany, Rotteck was exposed to slander, the cause of which is, that he, in the year before France had subdued, the German governments took courage to punish those who had given offence. In consequence of a decree of the Diet, in 1833, the Baden government forbade Rotteck to deliver a public lecture in the University, which he had for Ritchfor, for five years, the right of editing any newspaper. Germany now looked upon him as a political martyr, and from its most distant provinces he received addresses and letters. His name was proposed as a candidate for the representa- tions of the people. The latter refused to give their sanction: they likewise tried to exclude him from the second chamber of the states, and to prevent his re-election; but there they failed, and from 1830 to 1840 he continued to represent Freiburg without any inter-
ruption. In 1840 the Baden government re-admitted him as a lecturer at Freiburg, but it was too late; after a severe illness in which the worst symptoms of the disease from which he had been exposed, 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 three editions, the last with a continuation of the history of the years from 1815 to 1840, by K. H. Hermes, Brunswick, 1841-45, 11 vols. 8vo., of which nine are the work of Rotteck, and the two last the continuation of Hermes. No general history has produced such popularity as this did in the production of Rotteck; in Germany it is in the hands of almost every educated family; its fame spread over Europe and America; and it was consequently translated into most of the European languages. The English translation by T. Jonas, Philadelphia, 1840-42, four vols. 8vo., 2nd edition, London, 1842, is a however only a translation of an extract of the General History, which Rotteck published under the title Aeng aus der Weltgeschichte, Freiburg, 1831, 8vo. four vols. 8vo. Contrary to the practice of most German historians, Rotteck simply relates history, indulging neither in critical investigation of tribes, nor in metaphysical contemplation of the broad facts of human deeds. But the whole work is presented 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 too much is the desire for retrenchment; the narrative is interrupted; and every page shows that the author possessed that rare taste and that discretion which enable a man to distinguish between trifles and important facts, and to give neither too much nor too little. The reader who 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 Hamburger's far-famed History of the Turkish Empire. Among the other works of Rotteck may be mentioned: beside the legal and historical works, (Postel as a Metaphysical Science, and of Public and Constitutional Law,) four vols. 8vo., 1829, &c.; Staatsrecht der Konstitutionellen Monarchien (The Public Law of Constitutional Monarchies); three vols. 8vo., 1824, &c.; Rotteck was the co-editor, with Welcker, of that excellent work Staatsgesetze, vol. (Political Dictionary), which is still unfinished.

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sword 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 Soltan; and he was in Palestine in 1253. Although some accounts have reached, and been generally be- In quest of that great, undiscov erable, Christian potente of the East, Prestor, or Priest John, had returned disappointed, and with very discouraging accounts of the difficulties which lay in his way, he did not decline to charge his imagination of that visionary personage; and being more anxious than ever to contract an alliance with that fancied Christian prince, he resolved to send another mission in search of him, and to have some certain information of the Tartar, Sartach, son of Bauto-Khan, who commanded in the western parts of Tartary, was a good Christian. If this Sartach were not Prestor John, still his faith and devoutness, if truly reported, must make him a valuable ally to the Christians who were warring in the Holy Land against the Paynim. The mission of Louis was, therefore, to find, that Tartar prince, where he might be, and to whatsoever end and danger. It was composed of Rubruquis, friar Bartholomew of Cremona, and a certa n friar Andrew, whose country or birth-place is not named. Rubruquis, though the youngest of the three, appears to have been considered as the head of the mission. He, 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 observed, in his own hand; and, as well as he could, in order to keep a full account of all that was done, and of all that was said; and, above all, in order to keep a record of the conduct and movements of the Tartars, who, as usual, were conducting their flocks and herds with them, he procured a guide and pushed rapidly for Sarai, keeping due South; and arrived at Cherson, the most considerable place in the journey, the dangers and fatigues of which were supported with admirable temper, and in the course of which he threaded the great defiles of Mount Caucasus, crossed the Araxes, and traversed Armenia, Persia, and Asia Minor. Rubruquis reached Tripoli, in Syria, in the month of August, 1255. He had been, altogether, about two years and six months on his laborious travels, and he now earnestly besought his superior in France, Louis, to set him free; for the French prince had quitted the East after witnessing the failure of all his hopes. But the Franciscan provincial, being a strict disciplinarian, ordered the poor friar to write to Louis, and then retire to the convent of his order at Acre. The manuscript account of the travels was soon transmitted to Paris, together with an earnest prayer that his Christian Majesty would obtain the provincial's permission for his going, for a short season, to France. It has not been ascertained whether he obtained the favour, or whether he remained shut up in his cell at Acre. Indeed, after his return to Syria, nothing more seems to be known about Rubruquis except that he was living in the year 1260, when he died. He is thought to have kept on his way back to Europe from the remotest regions of the East. He was a man of rare good sense. The sobriety of his descriptions is marvellous for the time in which he lived. He was beyond a doubt the first and only European traveller that gave a correct account of the Caspian Sea. (Hakluyt, Collection of Voyages and Travels, A.D. 1600; Purchas, his Pilgrimes, 1615; Recent Edition of Rubruquis' Travels from a MS. in the British Museum collated with other MSS. at Cambridge and Leyde, published by the Geographical Society of Paris; Charles Mac Farlane, Romance of Travels.)

RUFFO, FABRIZIO, born about the middle of the eighteenth century, was a younger son of a noble and wealthy Neapolitan family. He was brought up for the church, for which however he had little disposition. Being introduced at Rome to Pope Pius VI., he was in a manner by which capacity he exhibited considerable economic abilities, and he incurred the jealousy of many of the older members of the Roman court. At last, he resigned his commission, offered himself, to France, and became Ruffo, and appointed him intendant or chief administrator of his palace and domain of Quaetta. Ruffo was fond of agriculture, and it was there he supplied his leisure. He had no great stock, and when King Ferdinand was driven away from Naples by the French republican army in 1798, Ruffo followed him to Sicily. He had disapproved of the provocation given to the French, and he revolted against his sovereignty to the court of France, which sent Dumas, the French consul, with the favourite minister Acton. The latter, in order to get rid of his presence, recommended him to Queen Caroline as a fit man to recover the kingdom of Naples by placing himself at the head of the Royalist party, who was in

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which province the family of Ruffo had large estates, and exercised considerable local influence. The queen approved of the plan, however hazardous it might appear, and made the king sanction it by bestowing on Ruffo the rank of his vice-regal representative in the province. Ruffo had not only to escape from the intrigues and vexations of the court of Palermo, accepted the office. In February, 1799, he crossed over in a boat with an escort of only five men and 5000 ducats, and landed at Ragusa, a rib 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 republicans of Naples had committed many errors of judgment, and had exaggerated the rustic population, which were not ripe for the change from old absolutism to a republican form of government. The Calabrians flocked by thousands to Ruffo's standard. The army of 'the Holy Faith,' which was the name it assumed, marched to the town of Monteleone, which surrendered by capitulation, as well as Catanzaro; it afterwards stormed Cosenza, which was given up to plunder; took Coenzia though the treason of its commander; and thus in less than a month Ruffo 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 desperately, but the town was taken and plundered for three days, incommensurate with proportion. The provincials 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 retreating from Mayence towards North Italy, in order to oppose the Austrians and Russians, who were predominant in that quarter. Naples was left to its fate with only a small Frencharrison in one of the castles. On the other side, Ruffo was joined by some republican Italian and Albanian forces from Corfu. He then advanced towards Naples by Avellino, and surrounded the capital at the head of fifty to sixty thousand men, mostly irregulars. After some fighting outside the city, he mounted an insurrection in the province, which lower crept and within facilitated the entrance of Ruffo'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. Ruffo, willing to spare further destruction, entered into a convention with the republicans, who were to be shipped off for France. The capitulation was signed by him, and a part of the republicans were actually sent off to France, when King Ferdinand arrived from Sicily in the bay, at the end of June, on board the English admiral Nelson's ship, and refused to sanction the capitulation. Ruffo had exceeded the powers in treachery, with 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 Ruffo with having called for the Jacobins, for they were called the Jacobins and the cardinal, disappointed and humiliated, seized the opportunity of leaving Naples for the conclave, which had been summoned to assemble at Venice for the election of a pope. Ruffo followed the new pope, Pius VII., to Rome, where he was made Prefect of the Annona. Some years after he returned to Naples, where he resumed his place at the court. When the court of Naples was obliged to emigrate a second time to Sicily in 1805, in consequence of its own imprudence and tergiversations, Queen Caroline proposed to Ruffo to put himself again at the head of the country people to oppose the French, but Ruffo replied that 'once was quite enough,' and that life for such a event was more suitable. He went to Rome, where he remained till 1809, when he went to France and made peace with Napoleon, and he was one of the censors who sanctioned by his presence his second marriage.

In 1814 he returned to France, and was made Pope, Pius VII., who died after a few years. After his death Ruffo returned to Naples, and took again his seat in the council, where he displayed a marked moderation of sentiments. He went to Rome in 1828 to the conclave in which Leo XII. was elected pope. Ruffo died in 1830, and was succeeded by his brother, who continued his work.

Ruffo was a man of ability and accomplishments. He was worldly and lax in principles, by no means fanatical or convertible, which, for his own time, was a 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. Troubled in all things, the inhabitants of the province of the republicans of Naples had assumed a task beyond their strength; they misflew 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 in our times. There is a graphic sketch of the adventures of Ruffo's life, in the Chronicles of the popular Tumults, published by Knight & Co. in 1837.

Contemporary with this Ruffo, there was another Cardinal Ruffo, of another branch of the same family, who was long archbishop of Naples, and a great writer and scholar. (Petrornati, Stella della Spedizione del Cardinal Ruffo; Collettta, Storia del Reame di Napoli; Coppi, Annali d'Italia.)

* * *

RJEN, J. LAFIELD, an English jurist, who resided under Antinounus Canusianus (c. 111-217), whom he mentions once (Dig., 24, tit. 1, a. 4). He was also consulted by Paulus (Dig., 40, tit. 13, s. 4).

There are seventeen excerpts in the Digest of a work of Rahmilus entitled Regulalis. The Florilegium Index mentions only twelve books of this work, and the superscription 'Lib. xii.' in a passage of the Digest (42, tit. 1, s. 24) may be a mistake.

* * *

(Zimmern, Geschicht des Eim. Privatrechts, i. 889.)

RUGENDAS, GEORG PHILIPP, a celebrated German battle painter, was born at Augsburg in 1696. He was the pupil of Isaak FLeche, an eminent historical painter in his time; but Rugendas devoted himself at an early age almost exclusively to battle painting, in which he was partly conformed by the admirable battle-pieces of Bourgeois, Lemnike, and Tempes, which he studied on his journey to Venice, and afterwards by the pictures of the Flemish Schild-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 to him.

In 1759, after an absence of five years, he returned to Augsburg, and had the opportunity of witnessing its siege in 1758, 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 more than gained by excellent opportunities he found of perfecting himself in the line of battle-painting, 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. Rugendas 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-racing, but he was particularly celebrated for his pictures. 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 adapted to the subject, it is too generally from 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 Rugendas. He was the ancestor of a numerous family of painters and engravers, sons and grandsons. A Life of him by J. C. Fussli was published, together with a Life of Kupetzky, by the same writer: Leben Georg Philipp Rugendas und C. Johann Kupetzky; Zürich, 1746.

Christian Rugendas, his second son, engraved about sixty of his father's designs in a very spirited manner, chiefly in mezzotinto. His own etchings, of which there are about thirty, are also highly meritorious. RUCH. RACHEL, a distinguished Dutch painter, was born at Amsterdam in 1644: she was the daughter of Professor Ruysch, who had taught flower-painting by Willem Van Deelen. In 1656 she was married to the portrait-painter Francois van Mieris, who died 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 Artists of the Hague, and in 1708 John Williams, a member of the Pia, is recorded aged 98. She died at Amsterdam in 1760, aged eighty-six, and she continued to paint till she was upwards of eighty years old. Her works have been described by J. van Sichem. De Heem, and have sometimes been sold for very high prices, even 8,500 francs for a single picture.

(Van Gool, Nieuwe Schouburgh der Nederlandse Kunst schilders, 1724; Cabinet de Peinture de M. de Tilly, Giesch iden der Vaderlandsche Schilders, &c.)
RULER, PARALLEL. A good form of this instrument is explained in Marquay's Rulers, P. C. S., which is particularly applicable to the case in which numerous and related parallel lines are wanted. Such a form of parallel lines is a kind of two, which might well be called parallel rulers and parallel rollers.

The principle of the common parallel ruler is a parallelogram of certain dimensions, the history of modern mechanics, according to which, the angles altered, the other side changes, and the angles are the same. The first postulate, to the first side of its parallels. Two rectangular rulers are connected by two crossbars, and are often found in schools and style books. He says that in such a manner that the four pivots, two in each ruler, shall be the four points of a parallelogram. The line joining two pivots on the same ruler is always parallel to the length of the other. 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 parallelogram, in which case the instrument is worthless; and the sides of the two rulers, when the instrument is closed, may not be parallel to each other, 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 have the parallel required, it may happen that the first ruler has been taken on, a first guess, an advance again, and so on. Now, owing to the rotation of the pivots, this gives an oblique line in the instrument; so that it is only the case, in which the required parallel is given, the point from which it is to be drawn is off the ruler. To meet this disadvantage, and to give the instrument more content, 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 easily used, when well made.

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 roller being held in the middle and gently allowed to take its own rolling motion. If a ring be well drawn round the roller, it is good practice in drawing perpendiculars to adjust the roller 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, both edges of which are bevelled and divided into equal parts. The instrument is shown in the picture; the inch divisions being made to come exactly opposite each other. A roller is let into room cut out of the middle of the roller, in such manner as to project a little way, so that when the instrument is put down on the paper, either of the bevelled edges may be brought down on the paper, or both may be clear of it. In this case the roller (the efficient ends of which are strengthened) is used as a friend, and rolls easily, and additional stability is given if, while it rolls, one of the bevelled edges be slightly placed on the paper. The ends of the roller 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 equal divisions of the parallel. Perpendiculars to a given line are drawn by adjusting the roller so that one edge of the bevelled edge may travel on the given line. With very little practice this instrument is of great power and accuracy. Before using it, draw a line with it, roll it away, and then roll it up 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 roller at all until he has drawn pairs of parallels across each other, and satisfied himself that he can get the opposite sides quite straight.

A rough construction of this kind is now (very recently, September, 1846) sold under the title of 'Schleisinger's Parallel Roller,' and has been brought out by a firm of instrument makers, and sold with a flat bevelled 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 roller for other purposes.

VON Distinct writer on art, was born of an old family at Reinhardsgrimma, his father's estate near Dresden, in 1785. He was educated at the Gymnasium, or high school of Holzminden, in Brunswick, whence he went to the university of Göttingen. From this institution he neglected every other study for that of art, abruptly discon- tinuing his studies at the university and placing himself with the painter J. D. Fiorillo, well known as the author of a general history of Rome, and a person of extensive evenings. From Fiorillo Rumohr heard much about Italy which excited his imagination and determined him to visit that country as soon as he had acquired some knowledge of the various languages, and in order to prepare for his journey he went to the university of Göttingen, where he acquired a knowledge of the languages of the Low Countries, and in this was imitated by Cambrai. From 1804 to 1816 Rumohr went to Naples, and there commenced the formation of a collection of antiquities; he had already been collecting prints for some years. He returned to Germany in 1806, in the company of Ludwig Tieck. In Bavaria he was honoured with the confidence of the crown prince, the present King of Bavaria. From 1806 to 1816 he lived in the little art city of Holstein. Though he took great interest in the political changes of that time he meddled very little with them. His literary activity was connected with his work, and he published essays on various departments of art, and among them a work entitled 'Sammlung für Kunst und Historie,' at Hamburg, in 1816, 2 vols. 8vo.

In 1815 he revisited Italy, and commenced in Florence the researches for his principal work, the 'Italienische Forschun- gen,' of which the three volumes were published in two portions in a later period of his life. In Rome he found Overbeck leading the German artists into a new or rather old sphere of art, of which a conventional sentimentalism is the principal feature, and which forcibly impressed Rumohr. In 1827 appeared at Berlin the first and second volumes of the 'Italian Researches' (Italianische Forschungen) a critical work on the history of art, and compiled exclusively from the original archives and documents in various buildings at Flo- rence, in this work Rumohr clears up many obscurities and cor- rects several errors, and brings to light new facts. In 1835 he went to Italy, when he was consulted in the purchases for the new picture-gallery which was then being established at Berlin, and he acted as Cerievos to the present King of Prussia in Florence, where he paid the visit of a friend. He returned to his native country, and in 1839 was appointed professor of history of art in the University of Ulm, where he died, in 1846. Rumohr was a friend of the curators of the Munich Museum, and of various literary works now followed in rapid succession and on various subjects. In 1832 appeared 'Römische Geschich' der Kunsthistorik, at Stuttgart; 'Deutsche Denkmiüden,' at Berlin; 'Drei Reisen nach Italien,' at Leipzig; and the first volume of his 'Novellin,' at Munich, in 1834. 'Sule der Hölleflelf für Alm und Jung,' at Stuttgart; and 'in the Leipzig pocket-book Urania, Der Letzte Serrufl,' at Berlin, which was the first of a series on the history of art in Germany, and was continued in Munich, the second volume of 'Novellin,' and in Lübeck, 'Kynoleopomachia, der Hunfchustreit, mit Bildern von Speckter,' Dog Hunter's Fight, a satirical poem on the times. Erwin Speckter was a good artist of History of Art, admired by Rumohr: he died in that year. [Speckter, Erwin, P. C. S.] In the same year also appeared the History of the Royal Collection of Prints at Dresden, by Rumohr and the keeper of the collection, Professor Thiele; and at Leipzig, Contributions towards the History of Art and the greater completeness of the Works of Bartsch, by a member of the Royal Society, and newly pub- lished at Leipzig two works on wood-engraving, 'Haus Holbein der Jüngere in seinem Verhältniss zum Deutschen Formenschatz,' and an answer to a censure of this work, 'Ueber Verlassenheit des berühmten Meisters Rumohr.' Jacob, the Sachsgudnngen against the Schrift Haus Holbein.' &c. These
were followed, in 1837, by a treatise, 'Zur Geschichte und Theorie der Formschöpfung.'

In 1838 he made a fourth journey into Italy, but he did not go to Florence, as his tour was mainly on business. His views then as an artist. He published an account of his journey at Liibeck in 1838, under the following title:—

Reise durch die östlichen Bundesstaaten in die Lombardie und die Toscania; zu welcher er mit den politischen Aufgaben seiner Bischofsberufung auf Völkerkunde, Landbau, und Staatswissenschaft; — to which he published some additions in the following year.—Historische Beilcke, &c. He had produced a sketch of the art of the period in a new and friendly manner,— Über die Besitzmöglichkeiten der Colonien im Neu- en Toscana, aus den Urkunden; Hamburg, 1830. In 1841, however, after a fifth visit to Italy, to Venice, in the previous year, he returned to his more general subject the history of art, and published in Leipzig an inquiry into the invasion attributed to Finiguerra of printing with engraved plates on damper paper—Untersuchung, dass Mano di Finiguerra Einbild des Haaggriffen sagt gestochen Metallplasten auf genesse. Papier abzudrucken. This was his last labour in the history of art, and his last poetical production of this class was 'Raphaele Lenzl und Wander-Jahre.'

In 1843 he purchased a house in Liibeck intending to end his days there, and he fitted it up according to his own fancy. The winter of 1843 he spent in Berlin, and he was then attacked with water on the chest: he returned in the spring to Leipzig. Lenzl 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 July 25, 1843.

His last literary production was a preface to—Kampf
Demokratischer und Aristokratisher Prinzipien zu Anfang des sechszehnten Jahrhunderts,' Liibeck, 1843. It is a translation from the papers presented to him by Professor of number of Bruns. 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 Lenzl'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, 18th, 14th, and 18th 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 artists of the next and present age.

(Kunsthifti, 1844.)

RUNCIMAN, ALEXANDER, an eminent Scotch painter, was born at Edinburgh in 1790. His father was an architect and he was taught the arts of painting during his childhood, and he made coloured sketches in the fields as early as his twelfth age. At the age of fourteen he was placed in the studio of John and Robert Norris, John being considered as a journeyman painter and his brother, for about 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 many 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 1796 he took to historical painting, understanding he had more ability in this part of his art it seems to have been very little if at all improved. In 1798 he visited Italy, and at Rome made the acquaintance of Fuseli. Their tastes in art were very similar: both were absorbed in what is termed the sublime, and both were alike wild and extravagant in their execution. They were, says Allan Cunningham, 'rivals in that unhallowed licence of imagination, which introduced an air of inspired madness and considered extraordinary powers in the delineation of the stoutest subjects of which they employed their pencil.' Runciman remained five years in Rome, and when he returned home he carried from that country the innovations to British art, which were 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 1797, a fortunate time for him, for Pavilion, the director of the new academy of the arts which had been established at Edinburgh in 1790, had very recently died, and Runciman was appointed to fill his places, with a salary of 120l. per annum, then a sufficient income to support a young artist. He had two of the best patrons in Sir J. Clerk, of Pennycook, and Robert Alexander, an Edinburgh merchant. The former employed him on a great work at Pennycook, suggested by himself, neither of which was proceeded with; the latter employed him on 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 Cunnavor; the Battle of the Moors; the Death of Catholus; the Finding of Corban Cargius; Gogloosa mourning over Lamderg; Oina Morval; Cormac attacking the Spirit of the Waters; the Death of Cormac; the Hawaiian Wind; the First Visit to the Island of Inis Oirr; the Finding of the Spirit of Lua. The picture of Aganeerca 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; Cassandra and her nymphs surprised at the Water Side by Ulyses; and Agrigippa landing with the Ashes of Germanicus.

Runciman visited London in 1772 and exhibited some pictures there. He was greatly admired, and was much remembered by, says Allan Cunningham, is that he took up his quarters with the widow of Hogarth, who was in those days reduced to let lodgings for subsistence. Runciman died suddenly before his own door in West New-street, Oct. 21, 1798

In every year he had contracted an illness while painting the彭尼 cuick cupola, being forced to lie much on his back, and to this is attributed the deformity 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 work 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 imbecility. 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 a few etchings by him from his own designs: the best is considered 'Simonsen weeping over the Heart of Tancred.' He is said to have lived very agreeable in conversation; Hume, Robertson, Lord Kames, and Monboddo were among his associates.

(Cunninghams of Emlyn, Sketch Painters, &c.)

RUSSELL, WILLIAM, LL.D., the son of poor parents, was born in the county of Selkirk in 1741, and educated, very imperfectly, in the country and in Edinburgh. He served as a page in a regular regiment of foot, after which he went on a journeyman in Edinburgh, edited a collection of modern poetry and executed a translation of a tragedy of Crebillon, which was submitted to Garrick, but rejected. In 1797 he went to London to seek his fortune for some time, having nothing better than a place as correct of the press for Strochman the printer. While so employed, he contributed to periodicals, and published unsuccessfully several poetical and other works, among which was a History of America. In 1799 appeared the first two volumes of the meritorious and popular compilation by which he is now known, 'The History of Modern Europe.' The third, fourth, and fifth volumes, bringing the narrative down to the year 1760, were published in 1799. In 1787 he married, and took up his residence on a farm in Dumfriesshire, where he spent the remainder of his life. In 1793 he published the first two volumes of a 'History of the Ancient World, from the Creation to the Accession of George III.' These unfinished works, however, as well as several tragedies and comedies, were stopped by his death, which occurred in the year 1793.

RYLAND, WILLIAM WYNNE, one of the best Eng- lish engravers of the eighteenth century, was born in London in 1732. He was apprenticed to F. Bewer, a French engraver, who was settled in England. After the completion of his term of apprenticeship he went to Paris, and studied there chiefly under Le Bas for five years. He did not con- fines himself however to engraving, but applied himself also to manuscript drawing, and etching, a master of eminence, and
after whom he engraved, besides some others, an excellent plate of Jupiter and Leda; he also etched some plates after Oudry while at Paris, illustrating the fables of Fontaine.

Soon after his return to England Ryland was appointed engraver to the East India Company, an office he continued to hold till his death, in 1785. 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 evident,' says Mr. Hacker, 'that his engraving of the Princes of Wales is one of the most spirited plates engraved by any of the early English Engravers, that Ryland's engagements in the mercantile line as a prizetrader, deprived him of so considerable and so precious a part of his time, and prevented his pursuing the arts with the spirit and assiduity which was necessary, when his health seemed formed for great and extensive exertions. The works which he has left behind him abundantly prove that he had sufficient knowledge and judgment to have carried them to great perfection.' These last words refer to the sad event which abruptly put an end to Ryland's labours and life at once, but which Strutt, who must have known Ryland well, does not more particularly allude to. He was executed for forgery in the prime of life, July 29th, 1785.

Strutt, whose work was published only two years after Ryland's execution, seems to have abstained, from delicacy probably towards his widow, from a more particular notice of the disgraceful termination to his brother engraver's otherwise successful career. As this case is not known and as Ryland persisted in his innocence to the last, it may be here briefly related as the facts appeared on the trial:—Ryland appears to have committed himself to the charge of forgery commercially engaged as a prizetrader, has been already noticed. He had once failed in this business, but he afterwards honourably repaid all his creditors in full, though not before being seized by a shoemaker and the engravers of the East India Company in London appear to have detected several forgeries of their bills, and suspicion attached to Ryland, apparently more in one case. He recovered by however intimation of his impending arrest, and by the advice of his wife concealed himself, whereupon the East India Company immediately offered a reward for his detection. He had concealed himself in the establishment of a shoemaker at Stepney, having once given the man some shoes to mend, the shoemaker discovered the real name of his lodger, and gave notice to the police. When Ryland found that he was discovered, in a fit of despair he attempted to cut his throat: the attempt failed, but he seriously injured himself. A true bill was found against him by the grand jury, June 5, and he was tried at the Old Bailey July 26, before Judge Buller. The specific charge against him was for forging and uttering knowing to be forged a bill of 210l. on the East India Company. The case for the prosecution was this:—Ryland had uttered or negotiated two bills of 100l. each on the East India Company for 210l. and at the same date, the original bill in May, 1782, and the forged bill in November of the same year. The two bills were so much alike that none could swear which was the true bill, except by a comparison of crosses on the paper which had passed; and, what was of chief importance, the paper-maker gave evidence to the paper of the other bill being made after the date of the bill. The first bill had been fairly negotiated, but the party from whom Ryland asserted that he had received the second, a Mr. Haggleston, was nowhere to be found. These facts and the circumstances of his flight and attempted suicide were urged against him by the counsel for the prosecution. Ryland made his own defence, but owing to the soreness of his throat from his recent attempt, it was written, and read by the clerk of the court: the following were its concluding words, as reported in the Morning Herald of this day:—'Judge, I conjure thee in the name of God to forgive my guilt by my flight; but let thee figure to yourself the fears, the dread, the horrors, of an honest mind, pursued by officers of justice, to take my life, if I could not prove my innocence. I have spent a part of my time in these, the entreaties and prayers of a fond, loving, and beloved wife, and then concluded my guilt from my flight. They have also presumed to drag into evidence my attempt on my own life. I confess the accusation, and see no defence in the nature of insanity; how then will they, how can they, torture insanity into a proof of my guilt!

Two bills, one a good one, one a bad one, have been ascribed to me by some. I am willing to try the case. What is the true, can any man say either is the forged one? Mr. Holt, from his infirmity, may easily make a mistake; and where then is any forgery? I cannot think that the court and jury will sacrifice my life to presumption, and, where there is no possibility of innocence, take it away on groundless suspicions.' He was found guilty of uttering the bill knowing it to be forged.

After the verdict was pronounced, which he bore with the greatest calmness, he merely observed,—'I dare not challenge the justice of my verdict: I am, however, conscious of my innocence; and I hope that my life will be preserved by the king, if not in justice, at least on one account, because it has long subsisted.' He heard his sentence pronounced without being moved, and retired from the court as if unconcerned in the proceedings. He was executed at Tyburn on the 29th of August, about twelve o'clock, before a large number of spectators, who were well satisfied with a single room which commanded a view of the barbarous and disgusting exhibition: so great a concourse of people had not met for a similar purpose since the execution of Dr. Dodd six years previously.

Character and probability were much in favour of Ryland's innocence, though circumstantial evidence was against him. He was wealthy, according to his own account. Besides the salary of 200l. per annum as engraver to the king, he exercised a very lucrative profession, possessed a great stock in trade, and had a large property in the Liverpool water-works. And many witnesses had been heard before the king's commission to say that Ryland was the most agreeable of men, so much so that the informer, Mr. Strutt, had to testify that he was a man respected and beloved by all that were well acquainted with him; for few men in private life ever possessed more amiable qualities than he did. He was a tender parent, a loving husband, and a considerate father. He frequently straitened his own circumstances to alleviate the sorrows of others; for his heart was always open to receive the solicitations of distress.

Ryland introduced chalk-engraving (lines composed of dots) into England, and in the latter years of his life devoted himself exclusively to engraving in this style, in which he had no equal, but chiefly, except a few drawings by the old masters, after the works of the English school. That art, however, like all others, is to be regretted, as the works of that lady have little to recommend them to the lovers of art. Ryland engraved twenty-four prints after Angeliers, and one of these, Edgar and Elfrida, a large plate, which was finished by Sharp for the benefit of Mrs. Ryland, is one of his principal works. King John ratifying the Magna Charta, a large plate after Mortimer and in a similar style, was given in connection to it. Ryland left this plate also unfinished, and it was completed by Bartolozzi, likewise for the benefit of his widow. It is his best plate in this style; but the best of these chalk engravings have been the medallion mezzotinto engravings: the style was, however, like the in-sipid drawings of Cipriani, much in vogue in the time of Ryland and Bartolozzi. As an etcher, where the needle and graver are combined, Ryland was also excellent. The prints which he engraved in France were executed in this style, and Wattelet terms his execution in this style most picturesque, and adds that one would suppose his etchings to be the work of a painter. The chalk manner is exactly in its place in imitations of chalk drawings, of which there are no better examples than Ryland's own in the fine Collection of Drawings published by Charles Rogers, as the two of St. Francis, after Carlo Maratti and Guercino, and many others. This work is entitled, 'A Collection of Prints in imitation of Drawings; to which are annexed Lives of their Authors, with explanatory and critical Notes, by Charles Rogers.' London, 1778; containing in all 116 prints, some of considerable size, of which 57 are by Ryland, besides the admirable mezzotinto portrait of Mr. Rogers at the commencement of the work. Among the imitations to his large, in various styles, the following are particularly worthy of note, either for their excellence or on account of their authors:—The Last Supper, by Leonardo Da Vinci; two drawings, by Michael Angelo, one of the tomb and the second of the grounds of the Church of St. Peter, after Berirocchi, and a third, the Tomb of Apolloionis; God the Father blessing the Creation, three young men naked, and another drawing, by Raphael; St. Francis, by Carlo Maratti; part of the Cupola of St. Peter's, by Correggio; some of the Executions of St. Peter, by Lodovico Carracci; Joseph and Jesus, and Caricatures of Painters, by Albani; Lot and his Daughters, St. Dominic presenting St. Catherine of Siena to the Madonna del Rosario,
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 Veronese, and a Monk in his Cell, Rembrandt. Besides these there are drawings by the following masters:—Baccio Bandinelli, Battista Franco, Perino del Vaga, Bernini, Andrea Sacchi, Stefano della Bella, Borromini, Filippo Lippi, Guercino, Sacchi, the Counsellor, Parmigiano, Can. Francisci, an. Carracci, Schiöone, F. Mola, Elisa, Sirani, L. Cambiaso, S. Rosa, Jan Breughel, and P. Wouwerman. He engraved a few other prints also after P. di Cortona, Van de Velde, Ramsay, J. B. Oudry, and others.

RYSBRACK, MICHAEL. The date of the birth and the birth-place of this distinguished Flemish sculptor are differently given by different writers, but Charles Rogers, the publisher of 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 Walker 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 gathered credit and notice, especially to the throne of the Earl of Shrewsbury. 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. Gibbs, in 1724, undertook the monument of Lord Oxford, each for the statues on Prior's monument in the south transept (or Poet's Corner) in Westminster Abbey, while he gave Rysbrack only 35£. Rysbrack, however, soon became aware of his own merit, 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 that the disposal of the funds of the most splendid monuments was in Rysbrack's hands, it created a great interest in his fame, and his reputation was long confined to great public monuments, though the study of his works is well worthy of attention.

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, plaster busts and obelisks were also added. The handsome marble statue of Henry, the Duke of Newcastle, at Prince's Exchange, in London, is very tasteful. The Duke of Newcastle's statue in the Abbey, seems to have had an eye to that kind of tasteful expense. From the reign of Charles I. and James II. there are to be seen in Westminster Abbey, two statues of cherubines and flaming urns, generally satisfied the pietist of the time. Many of Rysbrack's stowed busts and bas-reliefs on those he decorated, but Sir Cloudesley Shovel's, and other monuments by him, made much of for love of beauty. One of these, the statue of Rysbrack, continues Walspole, '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 actuated wholly by the feelings of a sculptor, form and character being his exclusive study. He was the most industrious sculptor: fine works are to be seen by him in many parts of England, and in Westminster Abbey, at Stourhead, and at Bristol. In a few sculptor's workshops there has been more activity than there was in those of Rysbrack in Vere-street, Oxford-street, during forty years of the height of his fame. He worked in England through loyalty to his successful rivals Scheemaker and Roubillac, his occupation sensibly diminished.

Rysbrack's busts were very numerous, and include those of many of the great characters. His first 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 1735. Scheemaker also competed for this statue, and his model was accepted with 5£, though it was rejected for the design of Rysbrack, who received 3000£ for it; Walpole says 1800£. The monument to Sir Isaac Newton in Westminster Abbey, which was exposed in 1741, was executed by Rysbrack from a design by Kent. One to Mrs. Oldfield, in the cloisters of the Abbey, was presented the year before, was apparently his first independent monument in the Abbey.

In 1757 Rysbrack received 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 enemy. It was also the statue of George II., which was in the old Royal Exchange, London. He obtained more however reputation by his monument to John Duke of Marlborough and his duchess in the chapel. At Blenheim-house, Rysbrack presented the model for the tomb of John, 2nd Duke of Marlborough, who died young, supported by Fame and History: in the lower part is a base-relief 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 Roubilac; it was made in 1737. This college contains also some busts of distinguished members by Rysbrack. Besides what has been already mentioned there are the following monuments by him in Westminster Abbey:—

1. To Admiral Vernon, and Richard Ken, governor of Minorca, 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 (or Poet's Corner); and one to Daniel Fulleman in the cloisters.

The erection of Shakspere'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 statue of the Hermitage in the north aisle, with the figure of Poet and Painter, by Mr. Hoare. This Hercules is a species of historical figure, a record of the English gymnasiaum or amphitheatre for boxing, an institution which was put an end to, as the principal gymnasts 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 frequenters of this gymnastic amphitheatre. The arms, says Walpole, 'were Broughton's; the breast a celebrated coachman's, a busher; and the legs were those of Ellis, the greatest and greatest gymnatist.'

There are many other statues by Rysbrack—as a Flora, from the antique, at Stourhead; the Duke of Somerset, at Cambridge, presented by his daughter, in the possession of the Antiquary and Lady Gardiner; Duke of Coussac, a statue by Rysbrack, in his Duchess, in Salisbury Cathedral; Sir Hans Sloane, in the botanical garden at Chelsea, and his bust in the British Museum. Lord Elgin, Lord Goldsmith, Wits, Lady Booth, Leigh, Derby; 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 Salway; and the following busts:—Pope, Gibbs, Sir Robert Walpole, Duke and Duchess of Argyile, Lord Bollingbrooke, Wooton the landscape-painter, Martin Folkes, Ben Jonson, Butler, Milton, Cromwell, the heads in the Hortzmance at Richmond, and those of the English Worthies in the Ellysian 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 profession, he had no resources of his own. But the descendants of his effects—his remaining works and his collections of prints, pictures, drawings, marbles, casts, models, &c., including a large collection of his original drawings, which, says Walpole, were conceived and executed in one day of his life—though lamented by the ardent admiration 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 3, 1770.

(Rogers, Collection of Prints in imitation of Drawings, &c.; English Connoisseur; Walpole, Anecdotes of Painting, &c.; Smith, Nollekens and his Times, &c.)

RYSBRAK, a genus of sea-anemones characterized by the numerous tentacles from the base of the lips on the tentacles. (Owen.)
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**Note:** The content appears to be a page from a book or a historical document, listing various entries that seem to be related to legal or historical references, possibly from a legal dictionary or a historical index. The entries are organized alphabetically with some entries indicating pages or volumes of a specific book or series (e.g., VOLUME II).
S.

SABINEA (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 campanulate calyx, a four-angled and compressed staminal column, with an obtuse keel, rather shorter than the vexillum. The stamens are didaphous, the free one and four others half as short as the rest. The style is filiform, glabrous, and slightly compressed, linear, elongated, many-seeded, mucronate by the style. The species are unarmed West Indian shrubs, with abruptly pinnaed leaves, smooth mucronated leaflets, and one-flowered fascicled pedicels.

S. Florida 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. dulcis has its leaflets in 10 or 12 pairs, elliptic obloneg, the flowers appearing after the leaves. It is native of Martinique and Porto Rico.

LIBERTY, FORA Medica: Don, Gardener's Dictionary.

SABINUS, MASSURIUS, a Roman jurist, a pupil of Aleius Capito, and the contemporary of Coccetus Nerva. He lived under Tiberius, but he did not die in that reign, as is generally supposed. He is mentioned in the passage of Gaius (t. 218) referred to Massarius Sabinus, of which indeed there can be no doubt. Massarius Sabinus gave the name of Sabinian to the school which he founded and to that of the Proculiani. [Roman Law, P. C. 6. 3. 9.] He was near fifty years of age when he was raised to the equestrian rank, and was in such poor circumstances that he was supported by the fees of his pupils (Pompon, Dig. 1, tit. 2, 4, § 47). It is said of him by Pomponius, 'par l'habile præsenis scripta' (he was the first who gave opinions publicly). Though the word is restricted in the modern editions of the Digest, the passage is quoted thus by Zimmerman: 'publicis scriptor.' It follows however from what Pomponius says, that with Massarius began the practice of giving written opinions, which were sealed with the seal of the jurist (responsa signa).

The reputation of Sabinus is shown by the publicity of his name, which was equivalent to the title of a great lawyer (Pergius, Sat. v. 90; Attian, Epist, iv. 5); and by giving his name to the school, of which his master Capito was considered to be the real founder. This is evidence of the greater originality and more enlarged views of Sabinus. His great work is 'Libri III. Juria Civilia,' from which there is no direct excerpt in the Digest, though there are various fragments in Gallus, iv. 1, 13, 18, 20, 21, 55, 56. The system is followed in this work has a great influence on subsequent writers. Pomponius wrote at least 56 Libri ad Sabinum, Gallus 47, and Ulpius 61. The arrangement of the matter of the work of Sabinus is confirmed by the order of the bands from the labours of his three commentators (Zimmermann, p. 313, n. 2).

The other works of Sabinus were—Commentarii de Indigenis, 'Libri Memoriale,' 'Fasti,' books of Responsis, a Commentary Ad Edictum, and 'Libri ad Vitellium.'

Zimmermann, Geschichte des Rom. Privatrechts; Index to A. Gallius, ed. Gronov. 1706; Grohues, Fine Juriscom. saltoresum.

SABINUS, CAELIUS, M., a Roman jurist, and the successor of Cælius Longinus. He was made Consul Designatus (Tact. Hist. i. 77); and his consulship belongs to the year A.D. 69, in which Otho and Vitellius became Emperors. He belonged chiefly to the time of Vespasian. He wrote a work, Ad Edictum Aedilicum Curulium, which is cited by other jurists (Gaius, Dig. 30, tit. 1, s. 90); but there is no excerpt from Cælius Sabinus in the Digest. He also wrote on other subjects (Dig. 35, tit. 1, s. 72, § 67). The extract in Gallus (vii. 4. Flileost servus, &c.) is probably from Ad Edictum, for Gallus in another passage (iv. 2) speaks of Sabinus as the author of such a treatise, though he calls him in this passage, according to some MSS., Cæcilis. He is often cited in the Digest simply by the name of Sabinus (Dig. 30, tit. 1, s. 14, 17, 65). The Cælius Sabinus is cited by Gaius in the Institutions (t. 70, 141).

SACCHAROLACTIC ACID. [Chemistry—Mucic Acid, P. C. S.]

SADI. [Saadi, P. C.]

SAFETY-VALVE. [Steam-Engine, P. C.]

SAGENOCRINUS, a genus of fossil crinoids. (Aust. & Forr.)

SAGENOPTERIS, a genus of fossil ferns. (Presl.)

SAGARABORDA, P. C. S.

SAHARUNPOOR, a district in the province of Delhi and presidential of Bengal, in Hindostan, formerly extended northward from the city of Delhi as far as the Serebic Mountains, which form the northern limit of the immense valley through which the Ganges flows. The Ganges and Jamna, north of the city of Delhi, run nearly parallel to each other at a distance of about 50 miles, and the district of Saharunpoor 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. Masjadee Sindia obtained possession of it in 1766, and it was held by the Mahratta king of Affar, and afterwards by the Maratha king of Satara, and is held to this day by the Bhopal king. In 1804 it was formed into two divisions, Northern Saharunpoor and Southern Saharunpoor, with a civil establishment for each; but this arrangement has been since modified, and the greater part of Southern Saharunpoor has been included in the district of Merut. Of the district of Merut, or Southern Saharunpoor as it is still sometimes called, the chief town is Merut, in 28° 59' N. lat., 77° 45' E. long. Of the district of Northern Saharunpoor the chief town is Saharunpoor, in 29° 59' N. lat., 77° 39' E. long., and about 90 miles, direct distance, N. by E. from the city of Delhi.

HAMITON, Zoil Indic Gemmaceae.

SAILORS. [Sails, P. C. S.; Sails, P. C. S.]

SAILS. 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 [Sails, P. C. S. p. 318] 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 nautical phrase, 'sailed away.' To provide a remedy for this formidable evil, Mr. Archibald Trail 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 bolt ropes, 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 expedient the strain is so equalised 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 protective 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. Many naval men, after putting the invention to 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 kind, with a view to lessening the cost of the handker, a circumstance of great importance in a gale of wind, while a saving may be effected in the cost of the canvas suffi-
cient to make the extra cost of the protection only one-ninth instead of one-fifth.

SAINT GEORGE, SAINT MARY, SAINT MICHAEL, Islands. [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 to a canonry in the twelfth year. He however, escaped the severities of the Nationality, and under him acquired a taste for the natural sciences. He first devoted himself to mineralogy, in which he published some of the most wonderful works. On coming to Paris he studied very diligently, and in 1793 was appointed subsecutor and demonstrator of the Natural History cabinet, in the Jardin des Plantes. He was subsequently appointed professor of natural history by the faculty of sciences in 1796. 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 expounders of what is called philosophical anatomy. The idea on which this department of science was founded, he had in mind in his early works, and consequently 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 Cuvier, Lamarck, Cuvier, Persoon, Valenciennes, 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, made up of various parts, and that all animals, and that this unity is capable of explanation 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 organization of the leaf, might, in the same manner, be predicated in zoology of the various parts of the animals, and a knowledge of certain fundamental parts of their organization. Thus Geoffrey St. Hilaire, amidst his other labours, established the fact that the numerous boxes of the head of the fish, and by consequence those of the higher animals, were transformations of the simple vertebræ; 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 generally developed by 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 and essays on the principles of philosophical anatomy. At the same time he published the lectures delivered on natural history in the Jardin des Plantes on the principle of the unity of organic composition, with the title, 'Sur le Principe de l'Unité de Composition Générale,' which had a wide circulation. St. Hilaire, it seems,&amp;#39; 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 monsters. These beings, which had formerly been regarded as mere unaccountable freaks of nature, were now found to be the result of the action of fixed laws, and under their various forms susceptible of the strictest classification. This work contained a new classification of monsters, with a description of and comparison of 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 development of the embryo, and the development of the female fetus, in which the author pointed out the fact of a unity of composition in the reproductive apparatus of the sexes in birds and mammals.

A list of the works 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. His most important works were 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 Geoffrey 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 the three inquiries, a theological question. Geoffroy opposed the doctrine of final causes, asserting in opposition to the the sensitive unity of composition. In his philosophy he states that he knows nothing of 'intentions' or 'objects' in creation; and when Cuvier spoke of the power animal and to you in nature, he rejoined that there were no 'animals which had the 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 Cuvierians of the principles of the 'philosophical anatomy,' 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 'Philosophical Works of Naturalists,' 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.

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We must now present him exercising these quiet characteristics in a larger field, applying them to his conversion of causes, which 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 those persons. The city of Geneva had long ago 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 ancient dioceses of Chablais, Lavaux, and Gailard; coincident with these changes was a substitution among the inhabitants of the creed of Calvin for the faith of Rome. In 1560, Charles Emmanuel Duke of Savoy, assiduously interested in this anti-Catholic portion of his duchy, and his first care was to attempt to bring back the inhabitants to their former religion. (De Thon, Hist. Univ., l. aclx.) For this purpose he applied to the titular bishop of Geneva, Claude de Grandier, 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, 1564, the two missionaries arrived at the frontiers of Chablais, where they dismissed their servants and equipment and determined to travel on foot, in order more easily to discharge to the example of the Apostles. The town of Tonon, the capital of the Chablais [Chablais, P. C.], which contained only seven Roman Catholics, was the first place in which they exercised their mission; the fruit of it was not abundant. On the fact of this Christmas-eve of 1567 eight hundred persons were admitted to the communion of the Eucharist in the church of St. Hippolytus in that town. But the most important object Francis had in view was the conversion of the bishops of the Calvinistic party. To this end 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 the request of Beza, in the result of which that religious leader bowed down in obedience to the religious persuasion of the narrator. Whatever changes however took place in the mind of Beza through his intercourse with Francis, it is certain that it was 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 him an offer of a pension of 4000 crowns if he would conform to his church.] On the return of Francis to Annecy, in 1599, he was appointed coadjutor to Claude de Grandier, the bishop of Geneva, with the title of Bishop of Neapolis in particular indulgence, this being for a long time refused to accept, and only yielded on the earnest solicitation of the pope, Innocent IX.

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 IV. and the Duke of Savoy. At the time 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 ancient 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 chief wish was to be permitted to live and die among those whom Providence had intrusted to his care.

On his return to his native country, after a residence of nine months in France, as he was, by the death of De Grandier, 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 Chambesy, in order to this medium of 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 minutiae by his biographers, and are so interesting a compilation of the conditions of his life that it suffices in itself the dignity of greater importance in the sight of God than the exercise of bodily mortifications or the display of an ascetic austerity. On the 8th December, 1602, he was consecrated bishop of Geneva. His bishopric was characterized by a reform of usage among the clergy of his diocese, and to reform various abuses which time had gradually introduced; these measures he chiefly effected by the issue of mandates in which he was the more vigorous by virtue of his new authority and Christian charity. In short, he showed himself a worthy disciple of St. Charles Borromeo, whom he professed to take as his model in the discharge of his episcopal duties. (Bosio, Hist. de Genève, v. 2, p. 215.) Francis de Sales then proceeded to France, where he was again successful in making converts. Several months after he hazarded the repeated offers of advancement from the French king, while at the time he gave proof of his consistency in declining the proffered honour of a cardinal's hat from the pope, Leo XI. In 1607 he was applied to by the reigning pontiff, Paul V., to express his opinions on the extent of the efficacy of Divine Grace on the free will of man. It was principally on this question that the Dominicans and Jesuits were divided (Black Flowers, P. C.; Jacours, P. C.). His answer is expressed with so much caution that it is difficult to discover from it his real sentiments; they are, however, more clearly shown in his other writings, especially in his treatise on the Love of God and how to attain it in the midst of a Religious Life", a book which still maintains a merited popularity. The style, though perhaps too full of metaphor for modern taste, is devoid of affectation, and breathes throughout a spirit of truth. From the general account given by Michelet, it is safe to find, as it were, living fountains springing up, flowers after flowers, rivulets meandering as in a lovely spring morning after a shower. It might be said that he amuses himself too much with a shower; that his method is no longer so strong as his shepherds guide, but such as would suit a flower-girl: as his Philotheso would say, he takes them all and takes too many; there are some colours among them badly matched, and have a strong tinge of the extrinsic; yet it is very different.

In 1609, Jean Pierre Camus was named Bishop of Bellay, and he wrote to the Bishop of Geneva to request him to perform the ceremony of his consecration. Between these two remarkable men, whose habits and dispositions were very dissimilar, the closest friendship ever after subsisted. It is to Camus that we are indebted for a most interesting work, 'The Spirit of St. Francis de Sales,' which, more than any other, develops the private excellences of the saint. The following year Francis founded a religious order for females, called the Order of the Visitations, and placed it under the superintendence of a pious lady, Madame de Chantal, sister of the Archbishop of Paris, with whose desire he concurred on his visit to Dijon. The fervent admiration of this lady for the qualities of the Bishop of Geneva, to whom she had intrusted the direction of her spiritual affairs, perhaps too impassioned a pity which she so frequently addressed him, and which may be seen in the collection published at Paris in 1650, have been malignantly dwelt upon by some who have hitherto held it libelous to ascribe to the persons of such men as Bossuet, Fenelon, and De Sales. The increasing infirmities of the Bishop of Geneva, arising from the constant application to the duties of his office, obliged him, in 1618, to seek for the assistance of a coadjutor bishop, and, at the suggestion of Cardinal Frederick Borromeo, his brother, John Francis de Sales, was consecrated to that charge with the title of Bishop of Chalcedon. In 1619 he accompanied to Paris the Cardinal of Savoy, to whom the mission had been intrusted of soliciting for the Prince of Piedmont the hand of Christina, sister of Louis XIII. On the marriage of this princess he was appointed her almoner, in an office of which he first declined on the condition that it should not be allowed to interfere with the discharge of his other duties. But the undiminished energy of such a spirit was too overpowering for so feeble a frame. In 1622 he retired to Chambesy, in order to rest, for himself or for it by severer mortifications and a closer communion with God. He preached for the last time on the Christmas-eve of that year; the next day he was seized with a paralytic stroke, and on the 10th of December, 1622, he died in the 59th year of his age, to the great loss of his subjects, of which his body was conveyed to Annecy, as his festival in the Roman calendar.
S A M

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 two prominent virtues in his character, and it may be safely said that the former taught him to forget himself, the latter to be ever mindful of the wants of others. Between him and Fenelon a closer comparison might perhaps be made than with any other of his contemporaries. 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 theologian, and St. Francis de Sales, Henri de Maupas, Bishop of Erreux, Le Pere Goul, Mad. De Bussy Rabutin, and the Jansenist Binet. See also Alban Butler’s Lives of the Saints; Moretti, Diet. Histoire de l’Eglise, ch. v. (Answered.)

SA M A R A. [SHIENK, P. C. S.]

SAMEN or SEMIEN MOUNTAINS. [ADYBIHA, P. C. S.]

SA M E N E S S 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 《Discourse 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 yet it is a real constant. 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 it does any thing external, and 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 herein including something besides the body, whether that something be a property of an organized body, or something else. ‘The ground of the doubt,’ says Locke, ‘is the supposition that the same person be the same substance, as well as the same substance, as that which the mind perceives of our 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 sufficient. But 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, bow is the thing called consciousness of our existence? at any two successive moments. Is not this a new consciousness of the same person, or the same consciousness of the same person, but different successive consciousnesses? What are successive moments in a man’s consciousness of his own existence? It is more consistent with that consciousness which we have to the belief that the consciousness of our identity is not the same, and the same; 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 to say that a man’s faculties are subject to illness, and he may lose the exercise of his reason and recovery; or an accident may befall him, which for a time renders his bodily and mental powers inactive, though he may finally recover his former state of health.

SAMOLUS, a genus of plants belonging to the natural order Primulaceae. It has a 6-parted calyx, its tube adhering to the lower half of the germen. The corolla is salver-shaped with a short tube and a 6-parted limb with interposed converging scales. The stamens, 5 in number, are inserted near to the base of the tube of the corolla. For capsules half covered by the persistent calyx, many-seeded, and opening with reflexed teeth.

S. volandallis, brook-weed, has obovate or roundish leaves, the upper leaves blunter with a short integument. The flowers are monocious, the calyx blist and 6-toothed, the style trifid, and the capsule 3-locu- cious. S. aucupariun is a tree 30 feet high, with ohlong lanceo-
late, acute, serrate leaves, with an intermixture 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 a dark purple. It is native of the woods of Carthage.

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 somewhat cordate and expanding. The filaments longer than the calyx, the anthers ovate. The female flowers at the base of the calyx often solitary. The capsule or not is globe-shaped, with a meagre, 6-valved, 6-seeded, 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.

(Loedii, Flora Medicai: Burnett, Outlines of Bot.)

SAPONARIA (from the Latin 'sapos', '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 Caryophylidae. It has a 5-toothed calyx naked at the base, 5 clawed petals, 10 stamens, and 2 styles. The fruits are red globular.

S. officinalis, soap-sor, has fuscated corymbose flowers, a cylindrical slightly downy calyx, retuse crowned petals, eliptic-lanceolate ribbed leaves, and an erect stem. It is native of many parts of Europe by the banks of streams, and in Britain, amongst grassy river sides 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 garden border, but is found inconvenient, unless planted in pots, from the spreading nature of the root, which extends under-ground like those of cough.

S. vaccaria has pinnuled flowers, pyramidal, smooth, fine-angled calyxes; membranous outer bracteae; ovate, lanceolate, scutelate 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 lactic acid secret in cattle and sheep.

All the species of this genus are very ornamental. S. ocygnea 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.

(Doii. Gardener's Dict.: Thompson, Brit. Is.; Burnett, Outlines of Botany.)

SARCOSTEMMA (from σάρας, flesh, and στέμμα, a crown, in reference to the leaves of the inner corolla being flesh-colored by the natural order Apocynaceae. It has a rotate corolla, a corosnet of white stems; the outer one cup-shaped or umbrellate crenated, the inner one 6-leaved, higher than the outer one, with fleshy segments. The flower is nearly blunt and smooth, and the seeds cuneate. 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 lacticent 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-doubled between the petals, on very long peduncles. The segments of the calyx lanceolate, ciliated, and acuminate. The corolla white with a large fleshy similar wavy corosnet; the segments of the corolla fringed and purple.

S. Brownii is a twining glabrous plant, with lanceolate acuminated glabrous leaves, and interpetiolar umbels; the pedicels, calyxes, and corolla downy; the segments of the corolla and fringed and purple.

B (Loedii, Flora Medicai: Burnett, Outlines of Bot.)

SAROTHAMNUS, a genus of plants belonging to the natural order Leguminosae. It has a cupped calyx, the upper lip with 2, the lower with 5 teeth. The flower is long, conical, thickened upwards, and channelled within. The stigma terminal, capitulate, and small. The pod is flat.

S. scoparius, broom, is a species of the genus, is 6 to 8 feet high, angular, and glabrous. The leaves are terebinth or simple, the leaflets obovate. The flowers are axillary, solitary, or in pairs, shortly stalked, large, and of a bright yellow. The pods are dark brown, hairy at the base, and have numerous seeds. It is found on dry hills and heaths.

(Babington, Man. Brit. Bot.)

SARVINIUS, a name of several Roman jurists.

CLAUDIUS SARVINS, the name of a Roman to whom two Descriptions of Antoninus Pius are addressed (Dig. 20, tit. 5, s. 1, § 3; 50, tit. 7, s. 5); and a person of the same name was a person under the Divi Fratres, of the Pius Successors. 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 Venuleius Sarvins. There is a single Excerpta in the Digest in the Digest of Sarvins (7).

QUIIIA SARTINUS is cited in the Digest (34, tit. 2, s. 19, § 7) as the author of a work 'Aedictum,' in ten books at least. Whether he is the same as Claudius or Venuleius Sarvins cannot be determined.

VENULEIUS SARTINUS, a Roman jurist, who is simply called Venuleius in the Florentine Index, though in the titles of the Excerpta in the Digest he is often called Venuleius Sarvins (Alexander Severus, 68) 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 Actions, Six of Interdicts, Four of the Office of the Pagan Princes, Three on Publica Judaica, and Nineteen of Stipulaciones. The book De Poenis Paganorum has been already mentioned.

(Grolia, Vite Jurisconsultorum; Zimmern, Geschichte des Röm. Rechts, pp. 354, 379.)

SAURICHTHYS, a fossil genus of fishes from Amouth. (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.)

SAUROPSIS, a genus of fossil fishes from the olit and liss crania. (Agassiz.)

SAUUREA, a genus of composite plants belonging to the sub-order Caryocarpaeae. The fruits are all hermaphrodite and tubular. The stamens with ciliated setae at the base. They are common in the temperate zone, the racemose scaly. The pappus in 2 rows, the outer one consisting of short, rough bristles, the inner one feathery. S. alpina has a stem from 3 to 12 inches high, erect, the leaves finely downy, smooth, the underside of the heads with pinkish florets and purplish anthers. The leaves are nearly glabrous above, cottony beneath, the lower ones ovate lanceolate, the upper ones sessile lanceolate, all distantly-toothed, the heads in a dense corymb, the involucre sub- cylindrical, with depressed hairy scales. This is the only British species: it is found in alpine situations.

(Babington, Man. Brit. Bot.)

SAUSMAREZ, 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 Sauzmarez, bears evidence of Norman extraction, and mention of it is to be 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 'Victory.' On the 17th of June he was commissioned in the 'Beds.' He afterwards served in the 'Narcissus,' 'Winchelsea,' and 'Levant.' He was afterwards appointed second-lieutenant to the 'Fortitude,' Ad-
mired Sir Hyde Parker, and he was in the engagement which took place on the 28th of June, 1782, while he was with 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 the "Vengeance." In the month of December following, Captain Saumarez was ordered to place himself under the command of Admiral Kempenfelt who, with twelve sail of the line, was commissioned to proceed to the West Indies. He was reinforced by 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 arrival of these ships, and the probable importation, and Captain Saumarez was selected for this service. While at Jamaica he was enabled, through an exchange, to obtain post rank and the command of the "Russell," a ship of the line. In this ship he greatly distinguished himself at the memorable battle of the 12th April, 1782. [Hoon, P. C.; Rodkey, 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 Saumarez was appointed to the command of the Crescent, of 36 guns, and of the fleet which was to proceed 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. This frigate had sunk the Crescent, but the French lost their Crescent had only one man wounded, and that by the recoil of a gun. The success of this action procured for him the honour of knighthood, and he was presented by the merchants of London with a valuable plate. In the month of November following, Sir James Saumarez was placed under the orders of Admiral Macbride, who gave him the command of a squadron consisting of the Crescent and Druid frigates, a brig, and a cutter: this was to assist the West India squadron under the orders of Captain Hood, to the joining of the Vondéans. On the 5th of June, 1794, an opportunity was presented him of displaying his skill and intrepidity; while proceeding from Plymouth to Guernsey with the Crescent, Druid, and Enterprise 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 Enterprise, 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 take refuge 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 secure, he bore up as if to run the Crescent on the rocks to avoid the enemy. The boat of signal was sent in, in order to steer through a narrow passage between the rocks, which had never before been attempted by a ship of her size; he thus reached in safety an anchorage where he was enabled to defray his own expenses and that of the family. In March, 1796, 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 fleet. [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 join with the Otho Fleet under Admiral Byron, of 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 shone with especial brilliance. Having been deputed to save the remnant of the unfortunate crew of the Orient. [Nelson, P. C.] A wound which he received during the action was so severe as to prevent his leaving the Orient on his return. On the 14th of February, 1799, Sir James Saumarez was promoted to one of the vacant colonels of marines, and to the command of the "Crescent," a ship of the line, and of the duty of the Channel fleet, under Sir Alan Gardner, to bring home from Lisbon the ships captured at the battle of the Nile. During the winters of 1799 and 1800 he was entrusted with the command which was destined to watch the French fleet in Brehat. 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 and perseverance of the squadron, that during the whole time he remained on that station, not a single vessel sailed from or entered the port of Brehat.

At the commencement of the year 1801, he was promoted to the rank of rear-admiral, and was ordered to the West Indies, under the orders of Admiral Lord Hood. On the 12th 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 to him of the number of the enemy's ships and frigates, and his squadron of that date was composed of the Crescent, a frigate and a frigate were in the bay of Algiers, and he 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 gun-boats. 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 attack 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, to render the Nile, the French alone were seen steering for Algiers, with a squadron of not more than half the strength of the enemy; the admiral determined to attack them, for the purpose of preventing their return to Cadiz, and, on the 8th, sailed out to meet them. The enemy formed their line-of-battle off Cabrito. 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. The wind was 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 Spanish re-entering Cadiz; they did so, however, with the loss of three sail of the line, and upwards of 2000 men, blown up, killed in action, and taken prisoners. An important result of this victory was the preservation of a large fleet of British merchants, which was the object of the French to seize. A most unfounded imputation has been attempted to be cast on the military character of Sir James Saumarez by a well-known modern French historian, who has asserted that, contrary to the rules of war, a 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. This assertion has been indignantly refuted by the concurrence of several officers 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, and seconded by Lord Hood, 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 Saumarez returned to England, and, in 1803, a pension of 1200£ a year was conferred upon him. On the renewal of hostilities, he was appointed to the command of the Crescent, which he held until 1806, when he was promoted to the rank of second in command of the Channel fleet under Earl St. Vincent. On the breaking out of the war, he was commissioned with the important command of the Baltic fleet. He there displayed considerable diplomatic talent, and, by his firm but conciliatory conduct, he was powerfully instrumental in deterring the Russians from a fresh approach to the North Sea. His policy he pursued towards the Northern States has been clearly detailed by his imperial biographer Sir John Ross in the work referred to at the end of this article. As an expression of gratitude for the services rendered to Sir James Saumarez, the Grand Cross of the Military Order of the Sword was conferred upon him by the king, Charles XIII. His influence with the king of Sweden was also the chief means by which the neutrality of Sweden was preserved on his association of Marshal Bernadotte as crown prince. [Charles XIV. of Sweden, P. C. S. P.]
The changes which took place in the aspect of affairs on the Continent having rendered the presence of a naval British force in the Baltic longer necessary, Sir James was recalled, and his recall accompanied by a letter from the Lords Commissioners of the Admiralty, in which they expressed "their marked approbation for 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 viceroyalty of Great Britain. 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 Saussure, of Saussure, 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 a most gratifying letter, which showed that time had not effaced from the mind of the king the services rendered by Lord de Saussure 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 and charitable affections 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 5th and 6th Wm. IV. c. 57, passed in September, 1835, extended the provisions of the 3 Geo. IV. c. 29, and of 3 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 also of the number of depositors on the 31st of March, 1844:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount of Deposits</th>
<th>Number of Depositors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summarized total</td>
<td>£ 15,007</td>
<td>318,148</td>
</tr>
</tbody>
</table>

Summary of the 577 Savings Banks in England, Scotland, Wales, and Ireland, on the 20th Nov. 1844.

<table>
<thead>
<tr>
<th></th>
<th>England</th>
<th>Scotland</th>
<th>Wales</th>
<th>Ireland</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Depositors</td>
<td>2,815,605</td>
<td>2,469,371</td>
<td>9,789</td>
<td>8,000</td>
<td>5,834,164</td>
</tr>
<tr>
<td>Amount of Investments</td>
<td>£ 213,781</td>
<td>£ 156,001</td>
<td>£ 31,756</td>
<td>£ 1,563</td>
<td>£ 382,696</td>
</tr>
<tr>
<td>Average Amount invested by each Depositor</td>
<td>81.6</td>
<td>65.1</td>
<td>32.7</td>
<td>19.5</td>
<td>60.6</td>
</tr>
<tr>
<td>Number of Deposits</td>
<td>18,907</td>
<td>15,144</td>
<td>729</td>
<td>478</td>
<td>32,018</td>
</tr>
<tr>
<td>Amount of Investments</td>
<td>£ 318,148</td>
<td>£ 263,680</td>
<td>£ 41,030</td>
<td>£ 22,086</td>
<td>£ 643,384</td>
</tr>
<tr>
<td>Average Amount invested by each Depositor</td>
<td>16.5</td>
<td>17.5</td>
<td>56.2</td>
<td>46.7</td>
<td>20.1</td>
</tr>
</tbody>
</table>

On the 9th of August, 1844, the royal assent was given to an act entitled "An act to amend the Laws relating to Savings' Banks, and to the Purveyance 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 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 on the back of the receipt this book is to be produced at the institution for the purpose of examination.

Any party, estate, or other person holding a situation at a savings' bank (s. 4), receiving deposits and not paying over the same to the managers of the bank, is declared guilty of a misdemeanour; 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, and with respect to 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 is made repayments not to be made without the receipt of both, or of their trustees, executors, or agents appointed by power of attorney.

Annuitants under the 3 and 4 Wm. IV. c. 14, are not to exceed 6½% a year in the whole, but separate annuities to that amount may be granted to a husband and wife; but instead of the charges under the former act, the charges are to be now (s. 9), for an annuity under 5½, the sum of 5½; 6½ and under 10½; 10½; and under 14½, 14½; and over 20½, 20½; and over 30½, 20½; and not exceeding 30½, 90. Where deposits exclusive of interest do not exceed 60½, (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 illegitimate and die intestate, the managers (s. 11), with the consent of the public, and with power to appoint a manager to collect the debts. 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 arbitration of the barrister appointed under the previous acts, who shall have power to determine any claim; and the barrister is empowered for this purpose.
(e. 15) to inspect the books of the institution, and to examine
witnesses on oath or affirmation: false evidence to be punished as
perjury.

Bonds 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 secure the payment of the annuities, or any other sum
necessary for the purposes of the establishment, to the
trustees and three managers when required to be cancelled.
Every officer trusted with the receipt or custody of money
(s. 17) is to give sufficient security, such security, when
given by an executor, assignee, or receiver of a se

lary, shall be by bond, which is exempted from stamp-duty.
The direction for depositing the rules of a saving's bank
with the clerk of the peace (s. 18) is repealed; but two
written copies of the rules are to be certified by the
barrister 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. 20) are to
be made to the next of kin by the law of Scotland, in the
case of deposits in that country.
The act is declared (s. 21) to extend to societies for pur-
chasing annuities as well as to saving's banks, and (s. 22) to
Great Britain and Ireland, Berwick-upon-Tweed, Guernsey,
Jersey, and Isle of Man.

SCABIOSA (from scabies, the Latin word for scab or itch, which
diskourge the common or net is said to cure), a genus of plants
belonging to the natural order Dipsacse. The inner calyx
consists of 5 bristles, the outer one is membranous and plaited.
The receptacle scale. The fruit nearly cylindrical, with 5 to 7
seeds in 4-6-8 wall, variegated, convoluted. The species are perennial or suffrutescent herbs with visible leaves.

S. suaveolens, Devil's-bit, has an abrupt root appearing as if it
were buried in the earth; at the end, the heads of the flower
and fruit nearly globose, the outer calyx hairy, 4-5-6 leaf, the lobes
ovate acute, the inner calyx consisting of 5 bristles. Tho
corolla is 4-5 leaf, the lower leaves toothed, the upper ones
entire. The stem and both sides of the leaves hairy or glabrous.
The flowers are white, blue, violet or purple, varying in

SCAPHITES, a remarkable cephalopodous fossil genus, irregularly
convoluted at both ends, and occurring in the lower parts of the cretaceous system. (Parkinson.)

SCAPHODUS, a genus of fossil fishes from the outie of
Stonesfield, (Anglin.)

SCARLET FEVER. [Scarlatina, P. C.]

SCARLATTI, RIGHT HON. SIR JAMES, LORD
ABBING, was a native of Jamaica, where his family was
wealthy and of long standing. He was the second son of
Robert Scarlett, Esq., and was born in or about the year
1760. His mother's name was Elizabeth Anglin. The fa
culty estates went, it may be presumed, to the eldest son;
a third son, who also remained at home and followed the pro
fession 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 edu-
cation, he, was, about the year 1786, entered a Fellow Com-
mone at Trinity College, Cambridge; and he was also, a
year or two after, admitted a student of the Inner Temple.
He took his degree, B. A. in 1784, and was called to the Bar
8 July, 1791; and graduated M. A. in 1794. His suc
cess at the bar was very decided from the first, and every year
added to his reputation and his emoluments. It was soon
found that he was a man of inestimable value to the bar,
being able to make such a large proportion of verdicts. Even while he was
still a junior counsel, he was very frequently entrusted with the sole conduct of important cases. At last, in 1818, he re
ceived a silk gown, and from that date he was recognized 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 Shiffer, who was
brought in, as second member, by a majority of 164 to 164;
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 1818, as one of the members for the city of Peterb
ough, under the title of Sir James Scarlett. 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 Macin
tosh 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 1830; but he resigned his seat in 1832 to stand
for Cambridge University. In his writings he speaks of the
constituencies of the House of Commons, and in terms which it
implies that they were then alive. Septimius Severus, afterwards
emperor, and Fabian, were pupils of Cerridvus, who pro
vided for them a capital education; but these great men did not belong to the Roman nation. See Saccus, in the article of
section iii; but his opinions gradually assumed more of a

(Dig. 17. tit. 1, s. 62); but the facts on which the opinion
is given are clearly stated. His style has been blamed as
false and inaccurate; but these qualities 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 Responsa, twenty Libri
Responsorii, and three books of Quaestiones, the latter pub-
lict tractaturn, probably a book of decided cases.
The Florentine Index also mentions a single book 'De
Quaestione Familiar,' but there is no excerpt from it in the
Digest. There are only 217 excerpts from the writings of Scac
vola in the Digest.

Many of the Responsa of Scaevola appear twice, both in
the Responsa and the Digesta. Conrabi, followed by Blume,
who supposes that the former contains a final edition of
the facts which are briefly indicated in the Responsa, and wcre
a kind of commentary to the Digesta. Puchta says that the
passages in the Digesta do not show this; and that this rela-
tions is rather that of the Quaestiones to the Responsa: 'the
Quaestiones were devoted to the complete examination and
justification of the opinions.

Clausius Tryphonius and Paulius commented on Scaevola;
and he is often cited by Marcianus, Tryphonius, Ulpius,
Paulus, and Modestinus. Scaevola commented on Julian and
Ulpius Marcellus.

[Greatissima, Vitas Jurisconsultorum; Puchta, Corina., itc. 1,
458; Zimmer, Geschichte des Röm. Privatrechts, p. 361].

SCALITES, MUSICAL of the GREEKS. [Muzac, P. C., p.
24].

S. Capitolinus, the inner calyx consisting of 5 bristles. The
corolla is 4-5 leaf, the lower leaves toothed, the upper ones
entire. The stem and both sides of the leaves hairy or glabrous.
The flowers are white, blue, violet or purple, varying in

It was usual regarded as the Sacerdos or Sacerdote of the
Trinity Church in France thinks the plant of Diosco-
rides is the S. Ambrosioides.

S. Columbaria has the outer calyx membranous, plaited,
and notched, the inner one of 5 nerves bristle; the corolla
4-5 leaf, the outer petals convex, the upper one
lyrate, 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
hills and calcareous rocks. It is a plant of some value that
has been discovered that, working on the ant, can allergic to
the 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
hills and calcareous rocks. It is a plant of some value that
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flowers are purplish, the involucres narrow. It is native of
Europe, Caucasus, and Siberia, and is very common on chalk
hills and calcareous rocks. It is a plant of some value that
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 Petersborough at a general election, obtained the office of attorney-general. He was at the same time knighted. Having been once more returned for Petersborough he held his place throughout the administration of Lord Grey; but was succeeded in the Charles Wellington when the Duke of Wellington became premier in January, 1828; but was re-instated in May, 1829, upon the dissolution of Sir Charles for his opposition to the Roman Catholic Emancipation Bill; and, having declared himself in the late general election in 1830, he remained attorney-general till the accession of the Whigs in November of that year, when he was succeeded by Mr. (now Lord) Denman.

At the general election in May, 1831, Sir James Scarlett was returned for parliament for Cockermouth. 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 also 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 Bury St. Edmunds, on the 20th of April, 1844. He had been twice married; first in August, 1792, to the third daughter of Peter Campbell, Esq., of Kilmorey, in Argyllshire, who died in March, 1829; secondly, in September, 1810, he married, as his third wife, Lady Sarah St. Jones, a sister of the Right Rev. R. 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 estates. His eldest daughter married Mr. (now Lord) Campbell in 1821, and was created a peeress in 1856 by the title of Baronesse Stratheden.

Lord Abinger was a skilful and dexterous rather than an eloquent lawyer, and while on the bench he was more distinguished for the clearness with which he summed up a case for the jury than for the profoundness or subtility 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 practitioner 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.

SCHNECKEL, CARL 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 15, 1781, at Neuppin, in Brandenburg, where he was 'super-intendent.' When only six years old he lost his father, and was taken to the care of his uncle, a merchant, in the 'Gymnasion' of his native town, where he remained till the age of fourteen, when he removed to Berlin. Soon after arriving there he obtained employment as an assistant to a pupil of the elder Gilly (David Gilly, born 1744, died 1800), a clever practical man in his profession, and author of several works on subjects relating to it. Hardly 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 than were generally entertained in those days, when a system of mere routine both in theory and practice prevailed almost universally. Friedrich Gilly and the young Schinkel, who was ambitious of elevating 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 painting and sculpture, wished that Gilly 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 thirtieth year, leaving Schinkel to inherit the name that might else perhaps have been divided between them.

Although so young, Schinkel had been instructed by Gilly to superintend the execution of some of his buildings, and after his death Schinkel carried on the embellishment. Having required such proficiency in practice it would not have been
difficult for him to have adhered to that course under the
profession; but he preferred pursuing his theoretical and
analytical studies; during which time he turned his exercises in
them to account. He afterwards published various ornamental
articles for modellers, metal-workers, and other artisans of that
class. Out of such earnings he laid by sufficient to enable him
established schemes for a pilgrimage to the
' holy land of art.' In 1803 he set out for the
Dresden, Prague, and Vienna; and after extending his route to
Naples and Sicily, returned to Berlin in the spring of 1805.
But there in a period of two and a half years he was at that
time engaged in something that was to be considered as
prestigious 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, there-
fore, as an occupation, making use of the special views of scenery
which he brought home from Italy, and embellishing
his compositions with architectural accessories, or else
making the architecture the principal and the landscape the
accessorial 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 acts of scenes, a collection of which, including those for
the Zauberflote, Die Braut von Messina, &c., were after-
wards published in a series of coloured engravings, whereby
they are rescued from the usual fate of similar productions of
the pencil. His various artistic labours during this period were
of the greatest consequence to him; for they helped him
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
own necessities, they were of service to the public in
recommendating him to the king, who, as soon as restored tranquillity
in public affairs permitted him to turn his attention to the
improvement and embellishment of his capital, began to em-
ploy Schinkel on those subjects which have a new aspect on
Berlin, and conferred on it a high architectural char-
ter. One of the earliest commissions of importance which he received from the king (who was then at London with the above-mentioned) was to join the collection of a national character 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 en-
aged. Among his earliest buildings were the Hauptwache,
Theatre, and Museum at Berlin, all of them treated in a pure
Heinrician 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 of form, a decided tendency to 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 ants (Erechtheum Ionic)
round a centre story on a flight of steps, enclosed by podestal 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 ants), 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 ac-
quires singular movement and play both of perspective and light
and shade. In which the wall forming the rest of this inner 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 com-
positions. There is reason, however, to suppose that either the artist or his disciples, who have been more or less being spoken of as the artist to whom the task is to be con-
fided; and only when the frescos shall have been added, will
Schinkel's idea and the effect contemplated by him for the building be fully executed. Neither is there the least
mention of any 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 exhibited to us in his 'Entwürfe,' an unusually full
and extensive series of designs for all his principal buildings,
some of which are illustrated and explained far less sparingly
than is the custom in similar collections; for besides orna-
mental details, many of them strikingly original as well as
tasteful, perspective representations of the different parts of
the building and of the 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
nothing to the task of reading Schinkel's fame much more
rapidly than it would otherwise have been the case; and
it is one that forms a very complete gallery of his unusually
timorous, many and less varied architectural productions. With such ready materials, a descriptive catalogue of hisuildings might be easily drawn up, but we can merely mention a few of them: the Werder Kirche (Gothic), Bauschule, and Ob-
servatory, at Berlin; the Theatre at Hamburg; Schloss
Krescowice, Charlottenhof, and the Nicolai Kirche at Pots-
dam, 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 [OTTMERS, P. C. S.]; and six several designs for
a monument to the Great, in which he gave free scope to his imagination, and indulged in luxuriant archi-
tectural pomp. Another publication, entitled 'Werke der
Höeren Baukunst,' gives us a series of designs by him for
the now extinct Academy at the Palais at Amsterdam, the
Acropolis, forming an irregular assemblage of courts, colon-
ades, and buildings, some of which, especially one magnifi-
cent saloon, would have been marked by originality of
character as well as by strict adherence to the Greek, in
which his 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 [ATHENS, P. C. S.], neither of them was adopted.
Another remarkable work of Schinkel's, his last one, not
his least poetical conception, was a design for a summer
palace at Orlanda, 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-Bau-
director; but it was to him a mere honour, for his career was
closed; his health immediately after the event had given
way, and in the autumn of the following year, on his return from
the baths, by whose waters he had hoped to be benefited, he was
attacked by an organic affection of the brain, which reduced him
to a state of almost unconsciousness; and his eyesight,
were somewhat impaired, his memory, 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 all
his work; and if he himself did much, his example and in-
fluence have perhaps 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
to the strictest letter of Greek examples, par-
sicularly 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 efecting and then
maturer new ideas from it. With all his invention, too, he
exercised none rather than the others in the light and airy
windows, for which he repeats the very same design again
and again in different buildings.

Schinkel has been made the subject of biographical notice
and of criticism more than any other modern architect. Of
two separate publications relative to him, one entitled
'K. F. Schinkel, Eine Charakteristik,' &c., 1842, is by Dr.
Kugler; the other by O. F. Gruppe; and both of them have
portraits of him, both by himself, and in different positions;
the latter represent him in his usual dress, and with his hat
on, and therefore conveys a better idea of his personal ap-
pearance.

SCHIZODUS, a fossil genus of conicheras, proposed to
include species of Aitzon of Sowerby.

SCHIZOPTERIS, a genus of fossil ferns (Brongniart)
in the shales of the Yorkshire coast.

P. C. S. No. 121.

Vot. II. — 3 X
C. between 1812, Le (The small S and ' traced review collection Frederic Romanism Among the tember, Heine early his the French. models for Weimar, 3 1767, intrusted with his name to an edition of Virgil. For some years Schlegel lectured at the university of Göttingen: his contributions to Bürger's ' Akademie der Sciences (especially on his poem on La Licorne,' and his essay on Dante), and to Schiller's ' Musen-Almanach' and 'Horen,' especially his translations from Dante with com- ments, secured him an honourable rank among the best writers of Germany. In 1816 he published the first volume of his translation of Shakespeare. In the same year he was appointed professor of Humanists 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 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 1806, having meanwhile imbied that puerile 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 continua- tion of Shakespeare, his translation of the 18th grade of the Periander, a critical 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; 'Athen &um,' a book which he edited with the success and in which he first betrayed his growing tendency towards Romanism and mysticism; 'Vorlesungen über Literatur und Kunst des Zeitalters,' (Lectures on the Literatur and the Fine Arts of the Age), which appeared in the 'Europe,' a review edited 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 poetic talents, and the manners of a courtier as Schlegel presented, she became his sincere friend, and henceforth accompanied her during several years on her travels through various parts of Europe. The reciprocal influence of these two distinc- ted talents was so great that each other was the reverse of his genius. They were published under the title ' Vor- lesungen über Dramatische Kunst und Literatur,' Heidelberg, 1809-1811, 3 vols. in 8vo.; and edition, 1817. A new col- lection of them was published in Berlin a few years before. In 1816 among which are his masterpieces, Arion, Pygmalion, Saint Lucas, and others. At that time Schlegel and his brother Frederic had already succeeded 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 re- generation. Some 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 cruel penalties, the importance of this opinion was made 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 mekest besides other romantic periodicals with 'Das Romantische,' 'Das Deutsche,' 'Das Literatur,' 'Das Recht Deutschlands,' 'Das Deutsche Journal,' 'Das Deutsche Almanach,' 'Das Deutsche Monthly,' and 'Das Deutsche Monat.' Among the best are 'Das Deutsche Museum,' 'Das Deutsche Journal,' and 'Das Deutsche Almanach.'

In 1810, 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 honours of the French language. 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 Vierge,' a translation of Tableau de Jean de Fieschi; with an notice on la Vie du Peintre, Paris, 1811; a fol.; an essay on the famous Venetian horses, which he declared to be of Greek workmanship, in Italian, in the 'Biblioteca Italiana.' 'Réflexions sur les Études des Langues Asia, adressées a 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 proviso to his appointment at Bonn, and at the suggestion of his brother Frederic, he had made up his mind to study Sanscrit. He so attracted a small number of students round him, and thus became one of the principal promoters of the study of the Ancient languages, and 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 brother with so much exertion was still trying to reduce to exhaustion, Turin, however, had yet no contemptible Sanscrit scholar, and surpassed Bopp and others in his general views: and it may be that his principal merit consisted in encouraging students and aiding them in pursuing the study of Sanscrit, Zend, Persian, and other Indo-Persian languages. Schlegel in his turn was assisted by the superior learning of Professor Lasen. 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, 'Ramāyana,' with a Latin translation and critical notes, Bonn, 1829; 'Bhāgavat-Gīta,' an episode of the celebrated Indian epic 'Maha- bharata.' It is in a great, and may be traced in his 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 mother's instance, he was published in 'Dante and His Contemporaries,' the Phoebus of Racine and the Hippolytos of Euripides, and this work was the foundation of his subsequent fame among the French. In 1806 Schlegel delivered at Vienna a course of lectures which was published in the 'Salzburgische Zeitung,' among which are his masterpieces, Arion, Pygmalion, Saint Lucas, and others. At that time Schlegel and his brother Frederic had already succeeded in founding, in opposition to the models commonly called classical, the modern romantic
Schoenberg is one of the most celebrated of the early German painters and engravers. He wrote, according to recent discoveries, born at Ulm of a family which produced many artists in the early part of the fifteenth century; his name occurs in Ulm documents from 1441 to 1461. The inscription which stood before his name in the gallery at Munich, though probably authentic, is apparently erroneous. He settled about 1461 in Colmar, and died there in 1485 or 86, Sandrart says 86, and various incidents prove the date by Nagler to establish this date. The time of this painter's death has until very lately been a matter of much dispute.

Martin appears to have been chiefly an engraver in his youth, and to have been called by the Italians Martino da Pordenone; and by a letter of Lambert Lombardus to Vasari dated April 27, 1566, and published by Gaye in his Cariclegio Inedito d'Arati, iii, 177, it is supposed that he studied under Roger Van Bruges, now from good evidence considered to be the painter of the portable altar of Charles V., which has been hitherto attributed to Memling. [Mem-}

3 x 2
SCH 524 SJC

S. myricoides is found on turfy bogs in Great Britain. It has a round naked stem, from 5 to 10 spikes, celed into a terminal roundish head, overtopped by the lower bract; the glumes scarious at the keel. The stem is clothed at the base with a tuft of pubescent sheaths of which each is


and in have His this the the formed & 38, Mr. The of schools of dark-brown be of evidence of return of Rev. of New of 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 in 1816.' Henry Brougham, once after committee, stated that he had been upward of six years in the superintendence of the cotton-mills there, and that there were 444 children in his schools at the time when he was examined (1816) from three to ten years of age, inclusive. As to the origin of these 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 for 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 schools:

'The children are received into a preparatory or training school at the age of three, in which they are perpetually superintended, to prevent them acquiring bad habits, to give them the best ideas of cleanliness and mutual kindness, 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 comprehendible by them at this early age. The children are taught also whatever may be supposed useful that they may understand, and this instruction is combined with as much amusement as is found to be requisite for their health, and to render them active, 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, that they may have opportunities of sufficient exercise. 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 make them capable of mutual kindness and a sincere desire to contribute all in their power to benefit each other, they are admitted into it; and in this school they are taught to read, write, account, and, the girls, in addition, to sew; but the leading object in this 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 instruction and useful amusement for an hour or two every day during the whole of this latter period.'

In the year 1819 Henry Brougham, the Marquis of Lansdown, 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 school at New Lanark; and James Buchanan, an experienced teacher at the Manchester School, 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 Wilderspin, a dissenting minister, as a demonstration. 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 office, and he and his wife, having saved some money, 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, London, 1824. The first edition was probably published in 1822, but we have 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 infant school at twenty years, and then went to America.

A pension of 100l. a year was granted (August, 1846) to Mr. Wilderspin, who was before a committee 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 in 1816.' Henry Brougham, once after committee, stated that he had been upward of six years in the superintendence of the cotton-mills there, and that there were 444 children in his schools at the time when he was examined (1816) from three to ten years of age, inclusive. As to the origin of these 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 for settling the knowledge they acquire more firmly in their minds. They are continued in the school upwards of seven years.'

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the genus Sciara, of which a single species, the maggot, Sciara aperta, occasionally occurs from the seas of South Europe into our own. Haemulon, Pristona, Diagramma, and Amphipiron are among the many genera belonging to the second section.

DONEMOCINO, born at Palermo in 1765, studied in his native town under Rosario Gregorico and other good masters, and became a proficient in classical erudition. Afterwards he applied himself to the study of the mathematical and physical sciences, and to the theorems of the science of life, which he chiefly devoted. In 1796 he was appointed Professor of Physics in the University of Palermo. He was repeatedly sent by the government to various parts of Sicily to explore the geological, mineralographic, and agricultural resources of the islands, and to examine the results of his observations. He gave an account of the eruption of Etna of 1811, in two letters: 1. Lettere scritte da Catania a Monsignore Gramsci in Messina. 2. He wrote on the curiosities of the strata of Messina; 3. Memoria dei Fili Refidi, e i Vorticari appartenenti dello Stretto di Messina; in which he gave a better explanation of them than either Spallanzani or M. Recucci, has done. In 1788 he published an interesting paper, 'Topografia di Palermo e dei suoi Contorni,' in which he describes the geographical aspect of the tract, its geological and mineral formation, its vegetable and animal productions, and its meteorology, with the hortus focus, &c. In the following year he was sent to explore the mountainous group called Monti Madonie, the ancient Nebrodes, which rises in the centre of the island, especially with regard to the fragments of the ancient apparatus, &c. Di Benvenuto, 'Rappo della Visita alle Madonie, Iscriv. 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 recently occurred, and on the spot he observed 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 1829, on the occasion of some fossil remains found in the neighbourhood of Palermo, Scina wrote a 'Rapporto sull' Ossa Fossili di Mardolce e degli altri Contorni di Palermo,' which attracted much attention. When a volcanic explosion occurred in Sicily in 1880, Scina was sent to examine the new phenomenon, and he wrote a 'Breve Rappaggicli del nocciolo Vulcano.' Scina was not neglected by the Sicilian government. Both King Ferdinand and his successor King Ferdinand bestowed their favour upon him. In 1816 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 'Educatore dello Nobili Donzelle,' or 'House of Education for young Ladies of Bank.' In 1829 King Francis presented him with a valuable book, fixed at the library of the University of Sicily. 3. 'Elogeo di Francesco Maurolico,' a distinguished mathematician of Messina in the sixteenth century. 4. 'Memorie sulla Vita e Filosofia di Empedocle, Girgentino,' in 2 vols. Svo., Palermo, 1819, a work more censured but not less accurate and interesting than that of F. W. Sturz, Leipzig, 1805, on the same subject. Scina's book is divided into four parts: the first treats of the time in which Empedocles lived; the second is a biography of the Antiquite philosopher; the third treats of his philosophy; and the fourth is a collection of the fragments of his works translated into Italian. 5. Discorso inteso ad Archimede. 6. 'Saggio di Storia Naturale e Tertia di Palermo,' 1823, with a biography of that ancient and little-known Sicilian poet. 7. 'Prospecto della Storia Letteraria di Sicilia.' This is one of Scina's latest works, to which it bears a very fragmentary title. 8. 'Lettera al Padre Pianzi intorno a Girolamo Settimo, Matematico Palermitano.' 9. 'Esperienze e Soveroie sull'Elettromagnetismo.' Scina died of the Asiatic choler, which afflicted Palermo in July, 1867. He was one of the most learned men to remain Palermitani has produced.

(Tipalelo, Biografia degli Italiani Uomini; Mortillino, Sulla Pianta di Sciara, detta Sciara aperta. Abate Domenico Scina. Palermo, 1837.)

SCILOPTIC BALL is a globe of wood about five inches diameter, with a cylindrical perforation 2 inches diameter passing centrally through it, and having at one extremity of the perforation a glow iron. Connected, and fixed by a number 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 transmitted through the globe, are 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 distinctly visible. 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 correct positions. [Camera Lucida and Camera Obscura, 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 plano mirror being placed above it at an angle of 45 degrees to the horizontal, so as to reflect the rays from external objects down on the lens, the images forming 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 roof of a building connected with the astronomical observatory at Greenwich, Edinburgh, and Glasgow, for the amusement of visitors.

SCIRPUS, a genus of plants belonging to the natural order Cyperaceae and suborder Cyperoideae, is divided into nearly 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, inserted in the filiform not dilated base of the style. S. maritimus has stalked or scaly spikes in a dense terminal cluster, several foliaceous bracts, bifid glumes, with an intermediate point; acute segments and a trigonous smooth or crumpled style. S. Crinus and the tribe Scirpeet has a nut-shaped spore, which is 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. lascutia, Bullrushi, 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 emarginate, mucronate, glabrous, and fringed. The nut obtusely trigonous and obovate; stigma three. The panicle is not lateral, although the bract closely resembles a continuation of the stem. It is found in rivers and ponds in England. The root is saturated and is used in medicine. The leaves are employed for making matting, chair bottoms, and many other domestic purposes.

S. triqueter has a stem scutately triquetrous throughout, flat or concave between the nodes, and the spines ascending from the base, the upper one terminating in a very broad triquetrous leaf. The spikes are in a small cymose panicle, the glumes emarginate, mucronate, glabrous, and fringed, the lobes rounded obtuse, and the nut rounded oblate, plano-convex, and smooth. This species is found on the muddy banks of the Thames, near London, and the Arun, near Amberley, Sussex.

S. Holoschoenus is the &lt;br>&lt;br>
S. tuberosus is the Pl-tai, or water-chestnut, of the Chinese, and is cultivated by them for food in large tanks, which are regularly manured and the water at intervals drawn off. The tubers are eaten boiled or roasted, and are used as food and medicine. There are fourteen British species of Scirpus, none of which however are worth description on account of any qualities they possess. (Babington, Mem. Br. Bot.; Lindley, Veg. King; Burnett, Outlines of Bot.)

SCLERANTHUS (from scler-ath, hard, and &lt;br>&lt;br>
Scleranthus (from scler-ath, hard, and &lt;br>&lt;br>
Scleranthus (from scler-ath, hard, and &lt;br>&lt;br>
are small, greenish white, and sessile in the axils of the fork of the branches.

t. crassifolia, Annual Knawel, has subdecandrous flowers, seg-
mented by the stamens, six of the fruit, patent style, with a very
membranous margin as long as their tube. The styles are
longer than the stamens, the stem green and repeatedly
dishomotous. The flower green, often solitary. It is found in
the eastern part of the British Isles and Germany.

The rachis of the fruit is thin, and the seeds are round and in
the Polish cochinial (Coccus Polonicus) 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
border. Of one of the species are worth cultivating except in
b辜nical collections.


SCLERODERM, a genus of grasses belonging to the tribe Festucaleae. It
has unequal acute membranous glumes. The outer panicles with
4 main but distinct and parallel nerves, membranous, cylindrical
below, smooth, often keeled at the tip or with a very minute
membrane. The styles are terminal.

S. maritima has a branched panicle, the lowest branches in
pairs or simple, the branches alternately erect, the spikele-
ks linear, that are 2 to 6 flowered, the outer panicles oblong,
the midrib not reaching to the apex, the root fibrous, without rooting
scales. It is found on sandy shores in England.

t. procerula is known by its ovate lanceolate compact panicle,
linear lanceolate spikelets of about 4 flowers, the rachis terete,
angular, the outer panicles oblong, with an apicus
formed by the extremity of the dorsal nerves; the root is
fibrous; the flower large. It is found in salt marshes in Britain.

There are six British species of this genus.

SCLERODERM, the second family of Plectognathous
fishes (such as have incomplete and soldered jaws). The
Scleroderma are distinguished by their conical or pyramidal
snouts, with or without lateral teeth in the upper
jaw. The skin is rough, or covered with large hard scales.
The first division of Plectognath is named Gymnoderas.
The fishes included in it have no true teeth, but a substitute in
the form of scales, which were not rooted in the bone of the lower
jaw. It includes the Pterodon, the Diodon, the Orthoge-
ricus, or sun-fish, and other genera.

The Scleroderma are mostly tropical fishes, and are
remarkable for their hard dragon-like plates, the teeth,
the tail, the mouth, and gill-openings passing through
holes in its coat of mail.

SCLE/RODUS, a genus of fossils from the upper
Siberian strata of Lovlow, &c. (Asgasia.)

SCLEPENDRUM, a genus of forms belonging to the
tribe Apleneae. The soroi elonget, straight, and two-
gether. The lunula of each pair opening towards each other.
S. nuphar, Hart's tongue, is a particularly handsome and
ornamental plant, very different from every other British
species. It is universally and abundantly distributed through-
out the British Isles. It is very commonly found on old walls
and ruins. It was first found in Europe, sparingly towards
the south and in the United States. It is described as growing in Africa, Asia, or South America.

The roots are black, stout, and very long and strong, the
rhizomes blackish, scaly, almost spherical, the young
fronds make their appearance 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
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church. At the revolution the presbyterian form was re-established. The followers of this system, who through the opposition of the covenanters distinguished themselves, have been to be made an exclusive establishment, now thought that the hour was come for the extermination of their opponents; but they were told by King William that that was a word not in his power. Nevertheless, the first act of the Scottish parliament was the re-establishment of an act of the British parliament in 1710. This act created many disputes in the church; it occasioned the secession of 1736, and the act was passed [Free Church, P. C. S]. It was the cause of the great secession in 1843 [Free Church, P. C. S]. In the same year with that secession an act was passed for modifying the right of patronage, called Lord Aberdeen's Act, (67. 32) in which a measure was taken to have been passed for the purpose of satisfying the scruples of some clergymen who would not remain in the church as it was, but would continue with a less comprehensive measure than the Veto Act. The difference between these two systems was, in the first place, that the Veto Act bore to be passed by authority of the church, its supporters denying that they required the interposition of any lay legislature. By that measure, the simple object of a certain number of the male communicants without any reason given, was a cause of disqualification to a presbyter. By Lord Aberdeen's Act, any members of the congregation may object to the presbyter, stating his case in the courts, and they think them good, whether in their general tenor, or with respect to the particular circumstances of the charge, may give effect to the reason by rejecting the presbyter.

SCOTT. [Eldon, P. C. S.]

SCOTT. [Stowell, Lord, P. C. S.]

SCREW-PILES. [Sea-Lights, P. C. S.]

SCREW-PROPULSERS. [Stewart, Vasco-Navar, P. C. S.]

SCROPHULARIA (so named from its supposed use in cases of scrofula), a genus of plants belonging to the natural order Scrophulariaceae. It has a 5-parted nearly equal calyx, a globose corolla, with a short 5-lobed limb, the segments of which are rounded at the upper end, united into an upper lip. The style is simple thickened at the apex, the stigma emarginate. There are four fertile disomes (stamens) with the rudiments of a fifth appearing. The species are herbs or shrubs with an unpleasant smell.

S. perennis, Figwort, has cordate shining glabrous leaves, alternate peduncles from 2 to 5 flowered, the lobes of the calyx not membranous, globose and acute. The stem is acute-angled at the base, but obtuse apexed at the apex, and of a dark purple. The leaves are full of pellucid dots. The corollas small, purple, and veiny, the lobes all denticulated. This species grows in moist places.

S. nodosa has a round smooth herbaceous, which when bruised smells like elder. The root is whitish, tubular, and beset with pellucid knots. The leaves are stalked ovate oblong, acute, sharply and unequally serrated, hardly hairy on the back. The corollas are divided into two small lateral ribs. The flowers are a little drooping, the corollas of a dull green, with a livid purple lip, the calyx is smooth, the capsule ovoid ellipsoid, ridged and hairy. They have a bitter taste and a disagreeable smell. A decoction is used by farmers to cure the sear in swine. Wasp greatly resort to the flowers. Goats eat the plant, but other animals refuse it. It is native mostly throughout Europe.

S. aquatica has an entirely fibrous root. It is a smooth plant of a deep shining green colour, the stem is quadrangular downwards, the leaves copiously and finely serrated, heart-shaped at the base. The flowers are in clusters, their tube is green, the corolla of a deep red. The capsule globular. This plant is called Water Betony, Bishop's leaves, and Broadroot. It is called by the French Berbe du siege, because during the siege of Rochelle by Cardinal Richelieu the garrison supported themselves in extremity by eating the roots.

It was released from the list of the plants reported by the French Academy, that the plant is identical with the Equisetum of the Brazilians, celebrated as a corrective of the unpleasant flavour of senna. The Edinburgh college, in their common inflation of the plant, have placed it under the care of the Academy, and continued it, we infer that it was not found to exercise the desired effect. The disagreeable smell of the plant causes cattle to reject it as food. Bees collect much honey from the flowers.

S. stricta, or Figwort, has these six generally recognised British plants. They are very of easy culture and propagation, but prefer a moist situation. They are all readily propagated by seeds. The shrubby species require protection during the winter in some districts.

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

SCUTELLARIA (from the Latin 'scutella', 'a little saucepan', in reference to the form of the calyx), a genus of plants belonging to the natural order Labiatae. It has a campanulate bilabiate calyx, the lips entire, the upper one with a concave scale on its back. The tube of the corolla, much exerted, 2-lipped, with the upper lip corolla entire, its segments simple; the anthers of the two longer and inferior stamens 1-celled, of the shorter and superior one 2-celled. The species are annual or perennial herbs, rarely shrubs.

S. galericulata. Suckling has branched divergent stems, leaves on short petioles, oblong, lanceolate, cordate below, crenate, serrate; flowers axillary, opposite, and on short pedicels. The corolla is large and blue. The whole genus is remarkable for being provided with a curved, 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 Scullcap, is a humble glabrous plant, with its leaves on short petioles, the lower ones broadly ovate, the middle ones ovate-lanceolate with the base cordinate, the upper one lanceolate, rounded at the base; the flowers axillary, the stamens opposite, secured at their roots, their segments abruptly narrowed and hardly dilated. It is native of Europe and Siberia, in damp places, and of Great Britain.

S. lateriflora has erect fleshy stems, pedate ovate lanceolate acuminate, rosetted at the base; the upper floral leaves hardly exceeding the calyces, 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 remitter for bleeding, but on no good grounds. Most of the species of Scutellaria are very pretty ornamental plants, and will grow in any common soil.

(Doon, Gardener's Dictionary, Babington, Manual of British Botany; Burnett, Outlines of Botany.)

SCULLYODUS, a genus of fossil fishes. (Agassiz.) From the chalk.

SCYPHIA, a fossil genus of Spongiate. Chiefly in the chalk. (Goldfuss.)

SEA-LIGHTS. Since the publication of the article Lighthouse-Houses, P. C. S., p. 478, some changes have been effected in the management of the coast-lights and beacons of the United Kingdom, and many important points with respect to increasing the efficiency of sea-lights have been introduced. Our brief notice of these will be briefly founded upon the Report of the Select Committee of the House of Commons on Light-Houses, in the Report of 1845, 'Recent Improvements in Light-Houses,' published in the 'Penny Magazine' for 1842, pp. 286 and 294.

The Select Committee of 1845, having directed their attention chiefly to the better management of light-houses 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 Lighthouse-Houses), report that by an act of 1856 (6 & 7 Will. 4, c. 78), all light-houses and sea-marks on the coasts of England were vested in the corporation of the Trinity House (Triinity House of Deptford, P. C. S., p. 245), which was empowered by the act to purchase the private light-houses of Harwich, Dunse, Winterton, Husanton, 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, Sperms, and Tynemouth lights, which were held by private parties in perpetuity under acts of parliament.

The purchase of these ten lights was effected (the amount of the purchase money was £80,000) for the purposes for the interests of individuals, of 1,182,540l.; and the rights of the crown on the five first were surrendere`d on condition that the Possessions and Land Revenues of the Crown should not exceed £1,000,000, upon the issue of a 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 this act of parliament has gone, been carried into 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.

Sealights are commonly divided into two principal classes,
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 1838, we have omitted in those for 1844. These raise the number of local lights for the United Kingdom to 150, and the gross number of lights to 509.

Of the 04 fixed general lights in England and Scotland 76 were, in 1844, coterie lights, with an aggregate number of 1098 burners, which gives an average of nearly 144 burners to each light, and 18 were dioptric, of power equal to an aggregate of 288 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 was, therefore, equal to 1366 burners, while that of the 25 English floating general lights (exclusive of that at Plymouth breakwater) was 288 burners, giving an average power of 11.4 burners to each light. In Ireland the 27 fixed general lights had an aggregate power of 583 burners, which gives an average of rather more than 21.4 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; but while no complaints were made of their want of brilliancy or general efficiency, many were laid before the committee, both by pet owners and on their own admission, of the defective light, the inadequacy of lashing 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 1839 is evident from the following comparative statement of dues levied in each division of the United Kingdom in 1832 and 1843. The return for England and Scotland appears to apply solely to general coast lights, no complete account being given of the dues levied on breakwaters; 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 88,041l. belonged to the Trinity House, and 70,676l. to private individuals; in 1843 the whole fell into the hands of the Trinity House.

From the statements laid before the committee of 1845, it appears that these charges, which, in consequence of the general reduction of freight and the competition to which ship-owners are exposed, and to which we are interestingly alluded in the Report of 1839, are not only more oppressive to trade, but for the mere maintenance of the lights, but are also levied on a much smaller and more lenient plan, as appears upon particular branches of the shipping interest. Steerage packet companies especially complain of the amount of the dues as compared with the advantages derived. The Peninsular and Palace Steam Packet Company, for instance, being 20 years engaged under the charter, and their vessels employed on the Peninsular line, of an average tonnage of 368 tons, and making fifty-two voyages in the year 1844, paid 12l. 7s. 4d. per voyage for light dues, or 545l. 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 220l. 14s. per voyage, or 2696l. 8s. per annum. One case that appears of peculiar hardship is that of a small steamer engaged between Grunton, in the Firth of Forth, and Dundee, completing her voyages entirely by daylight, and therefore deriving no benefit whatever from the lights, but which, nevertheless, paid dues to the following amount in one year, during which it was at work for forty-nine weeks, and three weeks refitting:

<table>
<thead>
<tr>
<th>Country</th>
<th>Dues Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>162,177</td>
</tr>
<tr>
<td>Scotland</td>
<td>38,526</td>
</tr>
<tr>
<td>Ireland</td>
<td>42,601</td>
</tr>
</tbody>
</table>

Totals | 240,304   356,905 116,601

*49 belonging to the Trinity House, 1 under their management, and 14 in private hands; viz. 3 on lease from the Trinity House, 7 on lease from the owner of the respective lighthouses; 12 belonging to the Trinity House, and 1 under their management. Of the 25 public general lighthouse stations, but at four of these, viz. the Isle of May, Pentland Firth, Fladda, and the Eddystone, which are laid down in the table, the number of lights was as given in the table. These new light houses, not included in the return, were stated to be in preparation. In addition to the 29 permanent local or harbour lights reported, there were some used in the fishing season only.*

In 1844, 20 local or harbour lights were in commission. In 1832 there were only 11, and in 1835 only 15, 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 actually for that year), of 88 stations, classified as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Local or Harbour.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>57</td>
<td>651</td>
</tr>
<tr>
<td>Scotland</td>
<td>25</td>
<td>336</td>
</tr>
<tr>
<td>Ireland</td>
<td>29</td>
<td>318</td>
</tr>
</tbody>
</table>

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<td>336</td>
</tr>
<tr>
<td>Ireland</td>
<td>29</td>
<td>318</td>
</tr>
</tbody>
</table>

Total for forty-nine weeks | 7092. 4s.
1843 and 1844 thirteen voyages, with an average load of 400 tons, earning a gain of 2007l. 18s. 1d., out of which 69s. 10s. 7d., or more than 23 per cent., had to be paid for light-dues; and Mr. Ogilby, a London shipbroker of forty years' standing, stated, in evidence, that the traders to the principal ports of Ireland have paid on the average 5s. 14d. per ton on the average of the year; that the Mediterranean and the South of Europe, making a less number of voyages, pay 3s. 6d. per ton; and that ships to India and China, making one voyage in the year, 1s. 14d. per ton; and that the coasting trade in the great western ocean, would, he thought, 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>Country</th>
<th>Scotland</th>
<th>England</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coasting trade</td>
<td>126,673</td>
<td>27,743</td>
<td>154,416</td>
</tr>
<tr>
<td>British over-sea vessels</td>
<td>97,454</td>
<td>11,601</td>
<td>109,055</td>
</tr>
<tr>
<td>Foreign vessels</td>
<td>53,646</td>
<td>4,496</td>
<td>58,142</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>257,775</strong></td>
<td><strong>43,840</strong></td>
<td><strong>201,615</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 carrying capacity, or, as it is termed, the 'tonnage'; if 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 deprived of considerable quantities of cargo, and the quantity of cargo; a course of proceeding which, in the commerce of Ireland, operates very injuriously on the merchants, and on the consumers in the smaller ports to which the vessels go for.

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 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 buying up private lights; and the future maintenance of public lights, buoys, and beacons either out of the public revenues, or by a small tonnage-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 the surplus revenue of the Corporation, which is that above the quantities previously paid for, like the present light-dues, a large surplus revenue for pensions and charitable purposes. They suggest that it may be considered whether the ships of the Navy, and those in the Customs, Revenue, and Excise, Service should continue to be, as they now are, exempted from the payment of these light-dues; and they conceive that a more economical mode of collection, by the agency of the officers of Customs, might be substituted for the present.

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 oil, which costs about 3s. 6d. per gallon, while the best sperm oil, which is usually burnt in English light-houses, costs 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 701, the total expense of the Flamborough light in 1843, 303l., was expended upon oil, and that in the Dungeness light-house the same item amounts to 225l. In a total expenditure of 592l. 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 overflow, and occasions increased labour in trimming the lantern, and, by theire being intermixed with a secret vegetable oil, makes the cost, and places next to it some of the South Sea whale oils, and then cocoa-nut and palm oils. In the United States, where the cost of maintaining light-houses is far less than in this country, experiments have been made on the comparative economy of various substances, from which it appears that burning for the whole night, and giving the same degree of light, 3-05 burners using hard-oil cost $2.49 cents each—

<table>
<thead>
<tr>
<th>Light</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>84.47</td>
</tr>
<tr>
<td>100</td>
<td>105.95</td>
</tr>
</tbody>
</table>

The following statement shows the average total cost per burner and per light-house of the public general lights of each division of the United Kingdom, and of the harbour-lights of Ireland, in 1844 and 1845. It is important to notice on the returns of 1832, the average cost for the United Kingdom being 456l. per annum in 1843-44, and 508l. in 1842:

<table>
<thead>
<tr>
<th>Country</th>
<th>Per burner</th>
<th>Per light-house</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>(a) £15 6s. 8d. 0d.</td>
<td>£14 2s. 0d. 0d.</td>
</tr>
<tr>
<td>Scotland</td>
<td>33 1s. 0d. 0d.</td>
<td>29 1s. 0d. 0d.</td>
</tr>
<tr>
<td>Ireland</td>
<td>22 1s. 0d. 0d.</td>
<td>24 1s. 0d. 0d.</td>
</tr>
<tr>
<td>France</td>
<td>17 1s. 0d. 0d.</td>
<td>16 1s. 0d. 0d.</td>
</tr>
</tbody>
</table>

We may conclude our statistical returns for England by noticing the number of buoys and beacons maintained by the Trinity House, and, for the sake of comparison, some figures relating to the sea-lights of France and America.

The beacon lights of the Trinity House, England, and Scotland, numbered 33, and in 1844, 46, showing an increase of 15. In 1833 the number of buoys under the same management was 227, and in 1844, 295, being an increase of 72. The beacons and other light-duties levied by the Trinity House, England and Scotland, and buos amounted to 14,207l. or 1042l. No corresponding duties are charged in Scotland and Ireland by the Northern Lights Commissioners and the Ballast Board, and the Light-houses Committee of 1845 recommended the abolition of such in England.

In France the light-houses and harbour-lights are all under a public board, and their expenses are paid out of the treasury, and met by levying a port-charge of 14d. per ton upon shipping instead of light-dues. There were, in 1834, 28 light-houses and 61 harbour-lights, making a total of 74; of which 29 were provided with lenticular apparatus, the nature of which is explained under Light-houses, P. C. S. No. 2671. The establishment of new lights has there proceeded more rapidly than with ourselves, the number having more than doubled in about ten years. In April, 1845, it was reported as 52 general coast light-houses and 101 harbour-lights, making a total of 153, of which 96 have lenticular apparatus. Some of these lights being grouped in twos and threes, the total number of light-house stations or separate establishments is only 105.

In the United States of America, where the general duties are supported by the general government, there were, on the 1st of July, 1842, 242 fixed and 50 floating lights, having an aggregate power of 2671 burners.

In advertising the introduction of one of the most 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 50 feet high, 16 feet in diameter at the bottom, and 4 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-lobits for the attendants, and storerooms for provisions, fuel, water, and oil; and at the top was to be the keeper's house, surrounded by an open hanging-galley, and surmounted by the lantern. Captain Brown conceived that such a structure would possess 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, seeing that it was no less affected by the wind meeting the light than 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
into effect, but a cast-iron lighthouse on a somewhat different plan was erected in 1842, by Mr. Alexander Gordon, upon an unhealthily lagoon in Jamaica, where, owing to local difficulty, it was required that a tower should be placed at the coast, which had been constructed for less than 20,000£, or in a less period than six years, with the almost invariable loss of many lives. For this locality Mr. Gordon designed an iron tower forming one of the height of the highest point on the coast of Ireland. The erection was determined upon by the commissioners in Jamaica on the 5th of March, 1841; eight months after that date it was ready for shipment; and it was erected near the mouth of the Thames, in October, 1841, when lighted until November. The cost of the tower and lantern, including the fitting up in London, to pieces, packing, and shipping for its destination, was 5,500£, and the putting up was done at a cost of 2,200£. The total outlay in the case above stated cost about 600£. 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 nearly an inch 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 fastened together with nut-and-screw bolts, and caulked with lead. The upper part 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 finished above by an iron rafter. The lantern is a cone-shaped iron box, with a glass dome, containing 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 lower part of the rock, upon which is laid a grooved course of granite to receive the flange of the lower plates, from which lighting conductors extend into the sea. The base is also encased with granite, to protect the iron from the action of 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-third of its height, 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 theoria, 'to preserve the air, and to regulate the temperature, the circumstances 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 interstice through which a constant ventilation is secured, so as to carry off the excessive 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 weigh about 190 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 intermittent thunder-storms, lighthouses are continually 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 points adverting to the economy 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 the Argand lighthouse at E.C., p. 249, has occurred, and which is very likely to recur as the substitution of fixed for floating lights in the vicinity of shifting sands, and the general extension of harbour lights, proceeds.

The first screw-pile 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 Goodwin Sands, where the extreme difficulties of the locality have hitherto deterred the Trinity House from establishing any other than a floating light or lighthouse. Mr. Bush's plan, as then proposed, was to construct, on land, a wooden truncated cone 100 feet high, 60 feet in diameter at the base, and 12 feet in diameter at the 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. The intervening space between the base and the cone would be filled with earth and 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 in which the inner cone was then to be drawn out, remaining in place, and leaving the outer cone, though not subject to the same fate, would be supplied with a solid mass of masonry or concrete, which might form a secure foundation for an iron lighthouse. The outer cone might, it was suggested, be eventually removed without prejudicing the security of the foundation, which has, at his own expense, partially carried out his scheme in a modified form, using a cylindrical casework of iron 64 feet high and 80 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 scheme we may notice, though not strictly falling within the subject of our present communication, that a lighthouse erected in 1840 upon another part of the same dangerous sands by Captain Bullock. This beacon, which is intended simply as a refuge for shipwrecked sailors, and not for a light, is a conical screw-pile, of ordinary material, 64 feet high, with a diameter of 30 feet, and stands about 40 feet high, surrounded by a flag-staff 10 feet high, and supporting, near its upper extremity, a gallery in feet in height, constructed principally of sail-cloth, and capable of holding forty persons, to which access may be obtained from below by means of ropes and cleats or notches in the mast. The mast or shaft is secured to a massive platform of oak, sunk several feet below the surface of the sand, and 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 30 feet above the dry sand at low water, and 17 feet 6 inches above high springs. 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. In 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 ordinary piles, rest upon a screw, which is firmly attached to the piles, and is fitted with an ordinary 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 wind¬ing round a conical iron core, 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, 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 purpose of extending these piles, on which purpose it bids 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 exposed to perish by the action of wind and wave than floating lights. The first screw-pile lighthouse was commenced on the Maplin sands, at the mouth of the Thames, in 1835, by screwing into the sands the eight wrought-iron shafts, arranged so as to form an octagonal light-house, 25 feet in diameter, and already on that part of the coast exposed to the constant and motion forwards at the upper extremities, and a ninth perfectly upright, in the centre. These shafts were about 25 feet long, and were screwed 20 feet into the sand; and to the top of each shaft a lighthouse were secured upon three or four 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, its purpose to prevent any breakers from entering into the new port of Fleetwood, which was completed in June, 1840, at a cost of about £3000. In both these structures the supporting framework is left open to a considerable extent, as being necessary for the purpose of keeping an extended surface for the waves to beat against, and are thus protected from the violent shocks to which other lighthouses are subject. A third lighthouse of similar character was erected in Carrickfergus Bay in 1844, as a fort, for state service and labour only (Mr. Mitchell giving his services as engineer gratuitously), of only 1000 l., although the building, being used also as a pilot station, is large enough for the residence of two lighthouse keepers and their families. The station, according to the framework two heavy pilot-boats. Economy of maintenance appears to be striking a feature of this kind of lighthouse as economy of construction, that at Fleetwood having in the five years between its erection and the date of Mitchell's evidence before the committee of 1845, cost nothing for repair beyond occasional painting. It has been suggested that life-boats might be kept suspended to such lighthouses, like the pilot-boats at Carrickfergus Bay. The parliamentary report of 1845 refers to another mode of inserting piles in sand for the purpose of supporting lighthouses, the invention of Dr. Potts, as being under experiment by the Turkish authorities, of constructing hollow iron cylinders by pumping out the air from their interior, and thus forcing them into the sand by atmospheric pressure.

Some ingenious suggestions of Mr. Alexander Gordon, with regard to the method of making the lighthouses seen from the sea, and other things in the report, relate to the use of a kind of hollow iron tower or funnel in light-ships, through which the lanterns might be hoisted and lowered for trimming more safely and conveniently than when attached to a mast, and through which men might ascend when necessary to attend to the lights, secure from the effect of rough weather; and also to a plan for distributing in foggy weather, by means of revolving parabolic reflectors, the light produced by a powerful whistle, constructed like the steam-whistle of a railway locomotive.

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 'United Service Journal,' 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 several times on the walls of theuin the part 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 upon a smaller surface. It is shown that the greatest advantages of revolving lights, for if, as the case is put by Captain Hall, instead of twenty-four lamps arranged at equidistant intervals round the circle, six be directed, by their reflectors, due north, six due south, six due east, and six due west, and then that part of the lighthouse upon which the four sets of lamps is mounted to cause 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 being mistaken for 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 might 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. If this could be accomplished, the result would, in a great measure, be the production of the line of the revolving light, be continuous in every direction.

An important improvement has recently been introduced by Professor Faraday in the ventilation of lighthouse lanterns. He has pointed out the great difficulty that has been experienced in the proper ventilation of lighthouses generally, ordinary means of ventilation, by allowing the free admission and egress of air, are inapplicable; but Mr. Faraday, having his attention directed to the subject by the first-lighthouse, has devised a method of ventilating lighthouses which has answered well, and which does not endanger the lights by permitting gusts of wind to get into the cowl. The contrivance is pretty fully described in an abstract of the paper referred to in 'The Athenæum' 1845, p. 637.

Sea-nettle. [Actinia, P. C.]

Seamen. Employment, Wages, &c., of Merchant Seamen.—The 6 & 8 Wm. IV. c. 19 repealed all former acts which regulated the employment, wages, and other matters connected with, merchant-seamen. The 6 & 7 Wm. IV. c. 19 has been repealed, (except so far as such act relates 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. 2, &c. regulate the appointment of hiring seamen; s. 6, &c. assign the punishment of seamen for refusing to join the ship, or abstaining themselves from it; s. 9 fixes the forfeiture for desertion; s. 11 the periods within which 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, salt, and other provisions for seamen; s. 22 provides in what cases there shall be a physician, surgeon, or apothecary on board; s. 19, &c. provide for a general register and record office of seamen; s. 31 provides for the disposal of the effects of seamen who die abroad; s. 36 provides that on board a British ship, and leaving money or effects not on board such ship; s. 32, &c. provide for apprenticing parish boys to the sea-service; s. 40 provides against masters of ships directing any person to be employed as a seaman in colonies or plantations, or at any other place abroad, except as herein provided; and s. 50 provides for seamen being in liberty to leave any ship and enter the naval service of her Majesty; s. 58 provides for offences against the property or person of any subject of her Majesty, or of any foreigner, committed at any port or place, either ashore or afloat, out of the dominions of her Majesty, by the master and crew; s. 61 declares to what cases this act relates.

Seamen in the Royal Navy and Impression.—It is stated by Blackstone, on the authority of Foster, 'that the practice of impressing and granting power to the admirality for that purpose is of very ancient date,' and that the present practice, is continued by a series of precedents to the present time, whence he concludes it to be a part of the common law. As impression is effected by the king's commission, the power of impressment being contained in the grant of the seamen for sea-service,' the limitations on, the 26th of March, 1846, p. 334, 5th ed., shows that the king used once to exercise the power of impressing men for the land service also, and even for his own private service, as in the case of goldsmiths. The legality of impressment is fully established, though the practice cannot be defended even on the ground of the safety of the state, until it has been shown that seamen for the royal navy cannot be procured by other means. The general rule is that all seamen are liable to impressment. There are several legal decisions as to the question who are seamen, and who may be privileged.

Volunteer seamen are induced to enter the royal navy by higher wages; and every foreign seaman who shall have served in a ship of war, a merchant-ship, or privater waters for two years during a war, is thereby naturalised. The 7 & 8 Vict. c. 112, s. 29, enacts that overseers of the poor, or other persons having the authority of overseers of the poor, in and for any district, union, parish, township, or place in the United Kingdom, may put out as apprentices in the British navy and merchant sea-service, all seamen of sufficient health and strength, with his consent, who, or his parent or parents is or are chargeable to or maintained by such district, &c., or who shall be held for alms therein: the time of apprenticeship in the case of such seamen shall be twenty-one years, or shall have served seven years as an apprentice, whichever shall first happen. Section 38 of the same act provides for turning over, with their consent, of garf apprentices, who shall have been bound to a master or service.
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. Section 59 provided that all British ships of the burden of 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 to such vessels be below twenty-two and under seventeen years of age, and be duly bound for four years at least. Section 59 provides, 'That nothing in this Act, or in any agreement contained, shall prevent any seaman or person belonging to any vessel whatever from entering into or being received 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, or be liable to the discharge of such 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 adapted to 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 emergency by offering them better wages, and thus the successor to the old system might be removed. To 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 former service the inconvenience 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 sedicio]. 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, sedicio was the technical word used in indictments for treason, till it was superseded by the word Productio.

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 comprehend pictures or drawings), calculated to lower him in the estimation of the community by injuring his government. All these 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 sedition and treasonable purposes, and against sedition meetings and assemblies.

The Roman sense of Sedicio (sed or se, and itico, 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 connexion with "politics," and "to riot," and seems to have the same significance. (Rein, Römisches Criminaledrecht, p. 522.)

SELM III., son of Sultan Mustapha III., was born Dec. 12, 1626, at Constantinople, and killed by his own brother Abul-Hamid, and Selim was shut up in the seraglio among the women and eunuchs. Abul-Hamid died April 7, 1639, and Selim then became sultan. The principal events of his reign are his remaining under the influence of Sofi, the chief eunuch, which was fatal to the state. He was deposed May 29, 1607, and Mustapha IV., son of Abul-Hamid, was elected in his place. Selim was put in confinement, and was starved by order of Mustapha, July 16, 1608, and the sultan was deposed immediately afterwards, and was succeeded by Mahmud II. (Mahmud II., P.C.S., Mustapha IV., P.C.)

SALVA, GIANNANTONIO, was born of respectable parents, at Venice, June 12, 1756, and had for his earliest instructor his uncle the Abate Giannemaria Selva, a man of considerable literary and scientific attainments. His inclination leading him to make choice of art as his future profession, he was placed in the studio of the celebrated Canova, who died in 1804, aged 72; but after he had grounded himself in drawing and the elements of painting, he passed to the study of architecture, and became a pupil of Taverna (Taverna, P.C.S.), and after leaving the studio of the celebrated Canova, with whom he visited Naples, Pompeii, Caserta and Poetum. While at Rome, he also obtained the notice and favour of his countryman the noble Girolamo Zuan, who placed him in the studio of the celebrated Mengs, and who was a liberal encourager of art. By him Selva was commissioned to embellish and fit up a salon in his palace expressly for an entertainment given to the Archduke Ferdinand of Austria and his bride; before which he had been similarly employed by the Senator Rezzonico to decorate an apartment for him, which was to have been done by Quarenghi, but that architect was then obliged to depart for Russia. (Quarenghi, 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 Venice at the close of 1780. There, as opportunity offered, he embellished various public and private edifices among them greater attention to internal convenience and disposition of plan, setting also the example of a more sober taste in design. Among the private mansions on which he worked was that of the celebrated Comte di Canova, in which he added the Loggia della Teresia, and the Palazzo Manin, which last, however (a work of Senovino's), he only restored and altered in the interior, though it was at first intended to greatly enliven the whole edifice according to foreign designs by him, and a model which is still in existence. He also rebuilt the Palazzo Pisani at Padua. The public work to which he owes his chief reputation is the celebrated Teatro della Fenice, erected 1790-91, and his design for which was selected from among forty by twenty-nine other architects (Theatre, Théâtre, P. C.). Another structure of the same class designed by him was the theatre at Trissie, 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 a theatre then lately erected there. To the above may be added the facade of the Casa Vigo d'Arreti, and a Casino at Padua; the Casa Vela at Verona; the facade of the church Santissimo a Udine; the facade of San Minuto at Venice, begun by Zagarini, and left unfinished by Selva, after which it was completed by Diedo. The same fate attended his last and most favourite work, the small church Del Gesti, which was finished after his death by Diedo (author of a work on the history of descriptions in Cicogna's "Fabbriche più conosciute di Venezia," and Giuseppe Boratto. Selva died rather unexpectedly, at the beginning of 1819, and therefore could not have executed, as Nugler says he did, Canova's church at Possane, 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; be as well as Diedo contributed to Cicogna's work above referred to; and there are also two small papers on the orders, and Chambers' 'Civil Architecture.' There is a portrait and short notice of Selva in Gamba's 'Galleria de' Letteriti.'

SEMIOTONUS, a fossil fish from the slim. (Agassiz.)


SENIUS AGER (in honor of John de Senehler, of Geneva, a vegetable physiologist), a genus of plants belonging to the natural order Crucifera. The pouch is somewhat kidney-shaped, entire at the end, or notched above and below, and almost to the middle. The seed is immediately after the flowers, and is covered with white
membranous 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 eatable. It is native of Europe, North America, and Asia, and is extensively cultivated for ornamental purposes.

S. didyma, has a pouch notched 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 in long clusters. It is found on waste ground near the sea in Great Britain. S. nitricia is eaten as a salad in Egypt. As these plants possess no beauty, they are not worth cultivating except in botanical gardens.

(Don, Gardner's Dictionary; Bahning, Manual of British Botany.)

SEQUESTRATION (Scotland), (Bankruptcy, P. C. S.)

SERAPROPE (P. C. S.)

SEQUESTRATION (Scotland). (Bankruptcy, P. C. S.)

SERAPROPE MISSION. A brief account of the origin of the Baptist Missionary Society, and of the history of this, one of the most important establishments connected with it, having been given under Missions, P. C. S., p. 270, 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.

Dr. Carey was the son of the master of a small free-school at the village of Paulcraggy, 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 ardor 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 alluded to above, 'On the advantages which gentlemen may, at 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 a more active interest in the cause of 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 English East India Company to any efforts for the evangelization of Hindostan, that Carey and his companion, Mr. Thomas, were, before the ship in which they set sail finally left the coast of England, set ashore 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 tosuperintend indigo-factories in the vicinity of Malda, sparing what time and money they could for the promotion of their primary object. In 1786 Carey began the work of Bible translation; and in 1799, in which year he removed to Kidderpore, he bought a press and printing apparatus. A third missionary had been sent out in 1796 to join Carey and his fellow-labourers, and he was at length received into the society, with including Mr. (afterwards Dr.) Marsham, and Mr. Ward, who had been brought up to the printing business, and to whom Carey had, before leaving England, expressed a hope that the mind of any of their construction of the necessary which might arise for his practical knowledge of the art, were rent 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. 259), where for many years the work of translating and printing the Bible continued. Various portions of the various languages of Hindostan was carried on with surprising energy. It appears from the appendix to a '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, 1832, the whole of the Bible was rendered into this language, and after the whole or part into at least thirty-nine other Oriental languages or dialects, 212,665 copies of the New Testament and other portions of the Bible having been issued during that time from the Mission press, in addition to many prints 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 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 India, a transit newspaper of Goldsmith's correspondents, a Treatise on Anatomy, intended as the first volume of an Encyclopaedia of the Sciences, a Treatise on Geography, and a translation of the Pilgrim's Progress. The list of works in all languages, native and foreign, 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 rested on his shoulders. In addition to the duties of principal professor of oriental languages in the college of Fort William at Calcutta, from its establishment in 1800 until its virtual abolition by the discontinuance of the fees of the university of the town, he was also awarded a pension from government. He died at Serampore on the 8th of June, 1834, in his seventy-third year, leaving some autographic memoranda which have been used by his nephew, H. H. Wilson, in the Rev. Eustace Cary's History of India, published in London in 1836, to which a portrait is prefixed. In 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 gentlemen of the first rank in the country, united, and which still continues an eminently useful and flourishing institution.' Botany was, indeed, a very favourite study with Dr. Carey, whose share in the publication of Rumphius's Elzas Indica, and of Parkinson's Roxburgh, P. C., p. 197. 'In this 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 expressive of 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. H. 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 a few works of Dupa, 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 governing the formation of their construction of the necessary, which might arise for his practical knowledge of the art, were not yet set out. As the East India Company would not allow them
the familiar use of their vernacular inflexions and idioms, the natives of India never thought it necessary to lay down rules for their application; and even in the present day they cannot exactly define them, or, by providing them, introduce correctly the dialects which they daily and hourly speak. Europeans, however, are differently circumstanced. With them the precept must precede the practice, if they wish to attain to a correct composition of a foreign language. But when the Oriental languages first became the subjects of investigation, these precepts were yet to be developed, and the early students had, therefore, as they gathered words and phrases, to investigate and to apply them to the rules of grammar, as they formed in frame, as they proceeded, a grammar for themselves. The talents of Dr. Carey were, he adds, "eminently adapted to such an undertaking." Mr. Wilson goes on to state that Dr. Carey "was a man of genius of a different order from any of his contemporaries. His mind was the only authority for the language of the Sikh nation; and although, he remarks, "he must concede to Halked 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 to the character of a regular and permanent form of speech, and as an instrument of a literature, as capable through its intimate relation to the Sanscrit, of becoming a refined and comprehensive vehicle for the diffusion of sound knowledge and religious truth." Some of the works he mentions as illustrative of the point of view held of the Sanscrit grammar, for example, comprising upwards of 4000 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 extensive literary productions of the Serampore press was 'The Ramáyana of Valmíeki, 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 this duty that he entered upon the difficult task of 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 a superficial acquaintance with the dialects, and of Sanscrit for the whole family, and endowed with a genius for philologica! investigation, Dr. Carey was peculiarly qualified to superintend the translation of the Scriptures into a number of cognate languages. It may be granted, that, in combination with his colleagues, he carried the project as 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 brother of proponents among whom the most prominent often styled themselves, it is not necessary to give any account. From a statement in the 'Baptist Magazine' for April, 1838, it would appear that he was born in 1768, and came to India in 1797. 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; he acted as their agent, returned to Calcutta in 1828, and resided there for thirteen years, until 1841, when he returned to England in 1828 on the same occasion. In this disagreement, which arose about 1817, the uncompromising and somewhat impracticable spirit of this otherwise excellent man, appears to have had considerable weight. In 1820 he was placed at the head of the printing-office of the Serampore Mission, a task which he performed with great success until 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 Missionary Society' he is said to have been possessed of great mental power and energy, and of a strong disposition to controversy, and of much warmth. Dr. Marshman's name is especially known by his controversy with Rammohun Roy (Rammoukor Roy, J. C. S., p. 464), who distinguished himself in the publication of 'Amrita Bazar Patrika,' a most interesting and able criticism upon idolatry, and by the publication of a work entitled 'The Precepts of Jesus, the Guide to Peace,' in which, while admitting the precepts, he expounds the miracles of Christ.

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 Dr. Carey 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. Since the death of Dr. Marshman the newly-established Missionary Society at Calcutta has been under the name of the 'Friend of India,' a periodical issued by the Serampore missionaries, which were subsequently republished in London, in 1822, in a separate volume, entitled 'A Defence of the Principles of the Bible.' In 1817 the first volume of the 'Friend of India' appeared, and in 1824 another London edition of Rammohun Roy's work, illustrated with portrait of the author, and containing replies to Dr. Marshman.

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 head ACCORDION, C.S., and under the term CONCERTINA, P.C.S. Nothing therefore remains to be added, except that the Seraphine is in the form of a chippot, 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, and of increasing the volume of sound by means 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 a swell. The effects to be drawn from so small an instrument are therefore limited, but they are praiseworthy 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
PERSERULIUM, a genus of annulose (?), from the Silurian strata of Salop, etc. (Marchion.)

SERIFALCUS, a genus of grases belonging to the tribe Festucineae. It has unequal herbaceous many flowered glumes, the lower from 3 to 5 nerved, the upper 7 to 9. The flower is oblong and triquet. The outer pairs with a short seta formed on three nerves from below the tip. The styles lateral below the summit of the fruit. The epipaleata navel at the top.

S. acutus has a loose panicle slightly compound, the simple peduncles about equalling the oblong glabrous spikellets, the flowers at first loosely incurved, afterwards distinct, about as long as the panicle, the outer paler not overlapping the next flower. The flower is large and downy, the leaves hairy with nearly smooth sheaths. It is native of Great Britain.

S. rotundus has a close or elongated erect panicle usually simple, the epipaleata glabrous ovate and somewhat compressed. The midrib of the glumes and palea scabrous towards the top, the leaves and sheaths slightly hairy. It is a common species in sandy places in south of Great Britain. (Wallingford, Manual of British Botany.)

SERICORNES (Insects), the third family of Penta-

S. centauri Coloptera. They have four palpi, elytra which cover the abdomen, and antennae, which are for the most part equal throughout, or smaller at the extremity. The Linnean genera Brachystomus, Elater, Lepismus, and Pityius belong to this family, as also do Melophyris, Cerura, and Cabio. The family Pityius is the one which have done so much damage among collections of natural history.

SERVITUDES (servitute). A servitude in the Roman law signifies that the owner of some particular property is bound in respect to some other person, simply as such person, or as being the owner of a particular property, either not to do certain acts to his property, or to allow that other person to do some particular acts to the property. The rights of this kind which one person may have to the property of another person are also called servitudes. The thing which is the object of the servitude is said service, to owe a servitude. It follows from the definition that a man can only have a servitude in another man's property, and in a corporeal thing; and that the owner of the servient property is not required to do any thing in order that the other may enjoy the servitude (Dug. 8, tit. 1, s. 16): his duty consists in not doing, and in permitting to do. The servitude must be a thing which gives some profit or advantage to him to whom it is due; and it gives him a right in re. In case of doubt there is no presumption in favour of a servitude; the term is those it is established are to be strictly interpreted, and its existence, and the rights attending it, in the way least prejudicial to the owner of the servient property.

A man must be the owner of a property, or have a dominium utile in it, in order to be able to enunciate it with a servitude awaiting on it.

Servitudes were either a right belonging to some particular person, which ceased with his life, unless they were granted to his heirs, and were called servitutes personalium or servitutes onerum; or they were attached to a piece of property, and were called servitutes rei, or servitutes praeedituum or servitutes servientium. Personal servitudes were in some cases called servitutes usurae, servitutes servorum; and servitutes servorum atque servorum. (Servitude, servitute, servitor, servitus.)

FRAZEL SERVITUTES were either Servitutes Urbanae or Rustices. They were Urbanae if the property which was entitled to the servitude was a building: they were Rustices, if it was a piece of ground. There was no limit to the number or kind of servitudes of this class which might be established. Those servitudes Urbanae which were of ordinary occurrence were such as follow: Servitites oneris servientium, the right which a man has to let his building rest on the building, the wall, or the gable which belongs to another's; his right to be indemnified for the damage which that causes him; Servitites servorum, the right of fixing a man's chimney in his neighbour's wall; Luminaria servientium, the right of a man's making windows or openings in his neighbour's wall, or in a common wall, in order to light his building; Servitites servorum, the right of opening holes or windows in a man's own wall, which holes or windows look into his neighbour's property, in such cases as would be unlawful without the existence of the servitude; Servitites servorum, the right of opening windows or openings in his neighbour's wall, or in a common wall, in order to light his building; Servitites servorum, the right of opening holes or windows in a man's own wall, which holes or windows look into his neighbour's property, in such cases as would be unlawful without the existence of the servitude; Servitites servorum, the right of opening windows or openings in his neighbour's wall, or in a common wall, in order to light his building. The common wall is the act of the subjects and the servitudes of the subjects of the state, and the servitudes of servitute are the act of the state, and the servitudes of servitute are the act of the subjects. It is the subject of the state, and the servitudes of servitute are the act of the state, and the servitudes of servitute are the act of the subjects. It is the subject of the state, and the servitudes of servitute are the act of the state, and the servitudes of servitute are the act of the subjects. It is the subject of the state, and the servitudes of servitute are the act of the state, and the servitudes of servitute are the act of the subjects.

Servitudes might be established by contract, at least in the case of a negative servitude, that is one by which the owner of the servient property was bound not to do certain things; by testamentary disposition; by prescription in the Roman sense; and in some other ways.

Servitudes might cease by the party entitled to them renouncing them by express words or tacitly: in the case of praevidens servitude, by one person becoming owner of the two properties, but not unless the whole of the servient or the whole of the dominant property was acquired; and in some other ways.

The actions that a man might have in respect to servitudes need not be particularly mentioned here, as the Roman forms were peculiar, and the object of this article is simply to show the general nature of servitudes, and the particular servitudes which may be compared with some of the easements and rights of
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. [Uxurxurius, P. C.]

The subject of the Roman servitudes would require a long exposition to be treated fully. A good outline is contained in [Wat, P. C., De Dominio, ed. L., p. 269, f. 36 ed.; and in Mackeldy, Lezheb, &c., ii. § 274, 15th ed.]

SESLERIA, a genus of grasses belonging to the tribe Seclerian. It has a spiked panicle, sessile spikelets tiled all round, the glumes from 2 to 6 flowered, nearly as long as the spikelet. The outer paleae keeled and membranaceous, with a scarious margin ending in 3 or 5 points, the dorsal palea evanescent.

S. sessilis has an ovate slightly one-sided spike, the outer palea terminating in 4 teeth, the dorsal palea rough, with a short excurrent point, the leaves shrew, with a minute rough point. The roots are tufted, the stem from 6 to 12 inches high. The spike about 4 inches long, and of a bluish-purple colour. This is the only British species. It is found chiefly on mountains.

S. quenensis is the Ficus quadridentata 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 1532; 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 the administration of justice, which in those times was mixed, with the legislative functions of that body, was often deputed to committees. These were termed Domini Auditores, or Domini ad Querelas, and received other like titles. We find their committees and their functions placed on a quite different footing 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 usher in the absence of jury trial as a fundamental feature in 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 judge of the nation, it would be an anarchy that a committee of that body should act through the aid of a jury. The number of the court as finally established in 1592 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 judges, who presided in union with English law. 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 president, or a deputy appointed in his absence of the chancellor. In 1806 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 only adopted in a limited number of cases, and is 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. Its chief 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 Commissionary Courts - were absorbed in the Court of Session, and the number of the judges was reduced at first to five, and then to fifteen to thirteen. By this measure the court was made to assume less the form of a deliberative assembly acting through a majority, which was the particular characteristic of the court before the reforms. The work was thrown largely upon individuals. By the act of 1830 (2 Geo. IV., 1 Will. IV., c. 68), as carried out by a later act (3 & 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 a court of second instance. The other five judges are called the Lords Ordinary, and each sits on his own, as if he held a separate court, which, in reference to 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 by appeal to a court of the Inner House, under the provisions of the act of 1830. The Inner House, where it may be pleaded again on the record as made up in the outer house. The system of pleadings has of late years been much abbreviated and systematised, and this, 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 Supreme Court of Session is the court of final appeal on questions of civil right. It gives remedy when other courts whose functions it is to regulate the rights and duties of certain sections of the public as members of a particular class - such as courts of real 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 1685 (This Church, P. 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 incidental circumstances and is 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 receivers, the supervision 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. 30), 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 those of judges of the court of exchequer, where the duty is to act as a court of quarter sessions of the peace. This change was made in the system of rotation in the performance of the duty of courts of which certain of the lords of session had previously been permanently appointed the judges. By an old practice in Scotland each 'Senator 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 general and quarter-sessions, is the subject of 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 sit as a jury on any indictment or other accusation of a person or persons or 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 or transportation and fine, or for any other felony when committed by a person not previously convicted, to be tried by the justices of the peace, or a court of quarter sessions, or any person appointed 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 gaol delivery for any county, may try in writing or writing by certiorari or other process directed to the justices of the peace acting in and for such county, &c., or to the recorder of any county within the same county, commandments of the said justices and recorder severally to certify and return into such court of oyer and terminer, &c., 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 any jurisdiction to try, and the several recognizances, examinations, and depositions relative to such indictments and presentments; and, if necessary, by writing or writing by 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 offences may be tried under the said commission. The fourth section empowers any court of general or quarter-session or adjourned quarter-sessions to try all crimes and misdemeanours of which a court of common law or a court of admiralty is not competent to try and which may sit apart for the better despatch of business, in the manner and subject to the conditions in this section mentioned. The word BALKANAI, is remembered, not for his literary merits, but for the extraordinary fact that he, a person of very small talents, was for a time the successful rival of one of the greatest poets of the nation. The particulars of his
history, with specimens of his works, may be gathered from various parts of Scott's edition of the works of Dryden. Settle, born in 1618 at Dunstable, was entered a commissary of Trusty College, Oxford, in 1666, but left the university without a degree, and came to London as a literary adventurer. The introduction of his unscrupulous patron, the laureate of his tragedy of 'Cantilyea,' and the prolific Boethus, destined to humble Dryden, eagerly adopted the new dramatist as his instrument. Settle's next tragedy, 'The Emperor of Morocco,' introduced his unscrupulous patron, the laureate of his tragedy of 'Cantilyea,' and the prolific Boethus, destined to humble Dryden, eagerly adopted the new dramatist as his instrument.

1677, Cambyses.

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Although his short-lived worthy tophcl, ' to toxicated history, various lanes.

of his history, the very little is known respecting the population. It is stated that a peculiar language is spoken by them. Their number, which formerly amounted to a thousand families and more, has lately been much reduced by the incursions of the Khan of Kundus, who has subjected Shagnan to a dependency on his authority.

(\textit{Wood's Journey to the Source of the River Oxus.})

\textbf{SHAGAN S. [LEATHER., F. C. S.]} \textbf{SHAGALLAS. [AUDITUS, P. C. S.]} \textbf{SHEATHING. Under SHIP-BUILDING, P. C. p. 386.} is given a notice of the introduction of copper sheathing in the British navy, and of Sir Humphry Davy's experiment for protecting the copper from the destructive action of seawater, as well as of the unexpected result by which his invention was rendered nugatory.

Owing to the great expense of copper sheathing, which has the effect of limiting its use in mercantile shipping, many attempts have been made to substitute for it either other metals, or alloys in which it is mixed with cheaper metals, or with metals that might increase its durability. In noticing several of these, Hebert, in the 'Engineer's and Mechanic's Encyclopaedia, art. 'Sheathing,' refers to a patent obtained by Mr. Robert Mushet (in what year he does not state), for 'certain mixtures or compositions of metals or mixtures of copper and alloyed copper, so as to render it more durable when employed as sheathing to ships' bottoms,' in which he directs that 100 lbs. of copper should be alloyed either with 2 oz. of the extract of zinc, 4 oz. of the extract of antimony, 8 oz. of the extract of arsenic, or 2 oz. of grain; or instead of using one of these separately, that the whole he used together in the proportion of half an ounce each of the zinc and tin, 1 oz. of the antimony, and 2 oz. of the arsenic, to 100 lbs. of copper. By these mixtures, Mr. Mushet states that the copper is rendered much more cohesive and firmous in its texture, and the corrosive effect of the sea-water is in a great measure prevented. We give an exact copy of the patent, and by the proper mixture of copper and metallic zinc, we are reduced to one fourteenth of the weight in the sheets.

Down to this time Settle had been a trusted servant and pamphleteer of Shaftesbury and the other whig leaders; and in November, 1680, he superintended with much approbation the laying of the first stone of the new church of St. Paul's. Beauforts afterwards left for ever suddenly changed his party, recanting his political heresies in a narrative which he published in 1683. 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 satirized on by his own pen. Settle's final error in politics shows at Bartholomew fair in Smithfield; and in one of these he actually performed in person the part of the Dracon slaughtered by St. George, a fact which Pope has cited as a proof that Settle had become a Jacobite. In 1696, in the reign of his Julio, he was received into 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. Mr. C. T. C.

\textbf{SHAEFF [Tunis. P. C. p. 309.]} \textbf{SHADOWS, PROJECTION OF. [PERSPECTIVE. P. C. p. 499, &c.]} \textbf{SHAGAN 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 38° N. lat., and between 70° and 72° E. long., but its exact boundaries are imperfectly known; the river Oxus which runs along its southern and western boundary, divides Shagan from Badakshan. As the bed of this river in these parts, where it is called Panj, is several thousand feet above the sea-level, its course is extremely rapid, which renders the access to Shagan 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 Fannir, on which the Oxus originates in the lake of Sir-Kul or Sir-Kul, above the mountain pass of Fatir, 150 miles above it. For the description of this inland place, the province of iron, there should be as much as 5 inches of zinc to 100 inches of iron, and smaller plates of zinc in the proportion of 3 inches to every 100, should be applied to the inner surface of the iron. All other tapping parts of the iron vessels also applied under the heads of the spikes or bolts used in
fastening the sheathing; and the heads of the nails employed are made hollow, and filled with melted zinc. This method is said to have been found effectual in a vessel which had 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.

SHEPHERDING by has masting small observed considerable in the natural order of the funnel-shaped corolla, a dry fruit, crowned with the lirip of the calyx, which is 6-toothed.

S. arcuata, corn-field madder, is the only species. The stem is a decumbent, branched, square, and leafy. The whole plant is rough and hairy. The leaves are 6 in a whorl, acute, and obovate lanceolate; the flower is blue, in a small sessile terminal umbel. It is found on sandy soils, in Great Britain and Ireland, and the Crimea.

The seeds only require to be sown in the ground in an open situation.

(Don, Gardener's Dictionary; Babington, Manual of British Flowering Plants.)

SHERIFF (Scotland). In Scotland the duties of the sheriffs are not, as in England, almost entirely executive. He exercises an extensive judicial authority, and a large portion of the business of the sheriff is of a purely judicial character. The sheriff is the judicial officer of the county, and is administered by the sheriff's court. The sheriff is also ex officio the administrator of the laws of the county, and is charged with the management of the county's finances.

In Scotland, the sheriff is an officer of the executive branch of government, and has the power to enforce the laws of the country. The sheriff is also the highest authority in the county, and has the power to grant or deny the issuance of any warrants or other legal documents.

The sheriff is elected by the voters of the county, and serves a term of years. The sheriff is responsible for the enforcement of all laws in the county, and is charged with the management of the county's finances. The sheriff is also the administrator of the laws of the county, and is charged with the management of the county's finances.
The act referred to, prescribes that the sheriff of each county shall have power and authority of abolishing all those remains of the feudal courts of Scotland which were hereditary, or in any other shape the nature of property; of bringing all judicial offices within the appointment of sheriffs, and to the exclusion of all other persons; and of conferring upon sheriffs power and authority over the sheriff-substitutes. This was in conformity with old practice, by which the sheriff, who might not himself be trained to the law, generally appointed a legal practitioner to act as his substitute. At the present day, the legal practitioner is known as a conveyancer; in every large county, in the larger towns there are two or more. Both the sheriff and his substitute are lawyers, but the latter is the local resident judge, the former generally frequenting the courts in Edinburgh, while the sheriff acts as such where the business of his office is the most important, and making occasional visits to his county. By the Jurisdiction Act it was provided that each sheriff should reside in his county during four months in each year. This provision fell into disuse, and it came to pass for such sheriffs as continued to practise at the bar to remain in Edinburgh, while the greater portion, who had given up or had not obtained practice, resided at their county-seats, or wherever choice or convenience dictated. In its time the law, like the other laws of the time, was in a state of animadversion by the friends of law reform, and a wide difference of opinion was expressed on the matter, some maintaining that the sheriff as well as his substitute ought to have an effectual period of residence in his county. In the case above cited, the former (who is styled Sheriff Depute) in Edinburgh 'was in some degree countenanced by high legal authorities, who consider the attendance of the sheriffs-depute in the court of session' during the sitting, 'to be more useful than anything, to a great adherence to the statutory rule.' It has been supposed that such an attendance tends both towards a higher degree of legal learning in the sheriffs and to uniformity of practice being promoted by those who are continually 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 the fountain of Scottish legal learning in Edinburgh, and by the 1 & 2 Vict. c. 119, it was enacted that each sheriff appointed after the 31st December, 1838, shall remain in attendance on the court of session, but shall hold eight courts in his county during the year. The sheriffs of Edinburgh and Lanark are exempted from attendance on the court of session, in the understanding that the business of their respective courts is sufficient fully to occupy their time. It may be mentioned that many law reformers, in order to secure the full and effective effect of the sheriff-substitutes, have suggested that these men should be paid salaries greater than 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 officers of the crown, there is no reason why a maxim like that should not be applied to them, that it is a matter 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 officers of the crown, there is no reason why a maxim like that should not be applied to them, that it is a matter 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 officers of the crown, there is no reason why a maxim like that should not be applied to them, that it is a matter of what the others ought to be. The incumbents receive much higher salaries than the other sheriffs, and have their time fully occupied.
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 Afghans and Sindis. 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 Sinda Canal. This canal was made by the Mogul emperor for the purpose of navigation and irrigation, and is, in its present state, only navigable from the end of April to the beginning of October, as it has been allowed to chock up at its mouth, and has generally got out of repair. But it is supposed that at the flood-time it may be rendered navigable for several 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 Sindibags. 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 of a considerable trade. The most convenient commercial road between Hindustan, Afghanistan, and Persia, runs 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 land of Iran, and 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 Dzongies, two Beloochee 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 at the opening of this place.

European and Indian goods are brought to Shikarpore by three different routes. From Calcutta they ascend the Ganges, and are taken to Louliana, whence they go down the Sinda Canal, and thence to Shikarpore, passing through Kyprope. Some of them go from Louliana to Lahore and Mooltan. These imports consist of raw Bengal silk, ivory, cochineal, spices of all kinds, coarse cotton cloth, raw Chintz, and silk manufactures, hemp, flax, cotton, net, metals, groceries, druggs, 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 chintos, printed, bleached and unbleached cottons, red and white cottons, yellow cottons, Juggermat muslin, black velvet, sheathing cloth, and coloured coarse broad cloth.

The second commercial road connects Central Hindustan with Shikarpore. The goods are brought to Pulse in Marwar, situated not far from the Aravalli range, and are taken through Jussumure and Kyprope to Shikarpore. Only a few articles reach that 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 Kurachee, a sea-port of Sind, west of the Indus. From this place they are transported by land to Schwim and Larkhan, and then reach Shikarpore. The returns of Shikarpore to British India consist of the produce of the country, especially rice, glue, hides, and wool, which are brought from Afghanistan are also exported, and dried fruits.

The exports from Shikarpore to Kandahar and Persia (Herat) consist of Indigo, beche, metals, coarse and fine cotton cloth, silk, muslin, pepper, rice, wines, quinine, muslin, and coarse silk cloth, silk manufactures, spices, raw cotton, coarse sugar, opium, beche, shales, embroidered home clothes, and grain. The returns consist of turquises, raw silk, manufactured silk from Herat of various kinds, dried fruits (prunes, dried black grapes, walnuts, dried apricots, almonds, and dates) in great quantities, tinned thread for embroidery (from Jollanabad), broken copper and brass vessels, madder, saffron, safflower, gum salop from Herat, manag, a dye prepared from the walnut-tree, dried mint, cardaw.% year, as many as 240,000, according to the communication of Ampére, were seen in North America. On the night of November 13, 1854, vast numbers were again observed in America; and on the same day of the same month in the years 1836, 1859, and 1868 the display of meteors in different parts of the world was remarkably numerous. Professor
Quidnix, at Brussels, observed that during the year 1838, 1839, and 1840 the shooting stars occurred on the nights of the 8th 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 the nights about the 2nd of January are singularly favorable. The months of December and January are periods at which the phenomena are, in most years, very frequent. The attention of astronomers has, however, been particularly directed to the 8th of August and the 12th 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 many other nights 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. Maclay, the astronomer royal, and it is obvious that, as their appearance or disappearance is instantaneous to persons stationed at different places, if it can be ascertained that a meteor observed by persons so situated is the same, the observations of the same meteor in the sky utilized. The first attempt to ascertain a difference of longitudes by such observations was made in the United States of America in 1825; seven simultaneous observations were made at Philadelphia and New York, in the month of October, 1826, and the 3rd 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 (2) of longitude between those places, when determined by other methods. (Silliman's Journal, October, 1840.) On the 10th of August, 1838, twelve simultaneous observations were made at Alta, and the same nights, within the same difference (28° 07' 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 appearance of the meteors in London and in the United States 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, which can be determined with more precision, gave results which agreed 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 places would 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 great interest which all such meteorological phenomena have, make a meteor from uncertainty, the chief obstacle to the general employment of this method of finding the differences of longitude between places. A few observations of such a nature have been made, but a little 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 a computed difference of longitude.

(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.)

SIBALIA (in honour of Robert Siddons, formerly Professor of Physick at Edinburg). A genus of plants belonging to the natural order Rosacea. It has a concea 10-petaled calyx, the inner segments necessary. It has 5 yellow or white petals, 5 sepals, and a lateral style. The fruit is in the form of a long axis, like a fruit, with a few seeds. It differs from the genus S. piperiflora in having a head of flowers, with three leaves at the apex, rather pilose, the flowers corolla-like, petals yellow, small, shorter than the calyx. It is found on dry mountains in Scotland, in Europe, Siberia, and North America.

S. piperiflora is a native of Cappadocia. It has trifidile leaves, the leaflets beset with aconite pili on both surfaces, the flowers con-

SIDDONS. MRS. SARAH, was born at Brecon, in South Wales, July 5, 1796. 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 premature an exhibition; but Mrs. Kemble boldly led the infant child forward, and displayed her as 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 age of thirteen, she was engaged at the Theatre, and placed under the protection of Mrs. Greenhead, of Guy's Cliff, Warwickshire, in the capacity of reader and companion. At the age of eighteen the affection of the young couple being unhindred by 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 happy,' remarks Mr. Boswell, in his Life of Mrs. Siddons, 'in the present...'
Lady Randolph, 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 illiberality towards two brothers performers, and in her absence she declined to sit upon the opening of Drury Lane, on the 5th of October, having been assailed by hooting and hissing on her appearance as Mrs. Beverley. On the 2nd of February, 1784, Dr. Siddons first performed Lady Macbeth, in 1789, Siddons opened Holland's new Drury Lane Theatre by the performance of Lady Macbeth, on which occasion her son Charles made his first appearance in the character of Macduff; and, in 1800, she again, as Lady Macbeth, was adored at the opening of the present Covent Garden Theatre, September 18th. The famous or rather infamous O. P. Row ensuing, seven months elapsed before she made her second appearance that season, repeating Lady Macbeth on the 24th of April, 1810. "Such an interval," says Mr. Bouden, "spoke loudly for the taste of a London audience." Two years afterwards, on the 29th of June, 1812, Mrs. Siddons herself, bare of the stage she had so long adorned by her genius and elevated by her private conduct, in the same celebrated character of Lady Macbeth, after which she spoke a farewell address, written by her nephew, Mr. H. B. Bordon, however, during the next season she was induced to revisit the scenes and revive the recollections of her former glories; she performed on the 25th of May for the Covent Garden Theatrical Fund; on the 16th of June for the benefit of Sir Charles Kemble's benefit, and the 29th of same month at Drury Lane for the fund of that theatre. In November, 1816, she acted for ten nights at Edinburgh for the benefit of the widow and family of her son Henry; again at Covent Garden in 1815, for benefits 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 one of the last (June 5) for Mr. C. Kemble benefit, and made positively her last appearance upon any stage at Covent Garden, June 9, 1816, for the benefit of Mr. and Mrs. Charles Kemble, in the character of Lady Randolph. For two seasons after her public farewell in 1812, Mrs. Siddons gave occasional readings alternately from Shakspere 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 honored 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; but she was not cowed; and the however there can be little doubt, from the following remarks, which she one day made, to an old and attached friend, an old friend, toasting her, "and if there is not love, I cannot speak. We were all in the month of the evening she had been accustomed to repair to the theatre to dress for the performance. At this time, she observed, every body in London is in the business of thinking of me. The tone in which this was spoken, and the sight which accompanied it, sufficiently indicated the feeling with which she contrasted her public and private life, although still the queen of every circle she condescended 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 suddenly forth into an exhalation that had never been witnessed, and railed in its charm the spell of the greatest enchantress 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 not long after. Cecil, the last child, and George survived her. Amongst the most celebrated portraits of this unrivalled actress are a full-length in the character of Isabella holding her son Henry by the hand, painted by Hamilton in 1762; another, in the character of the tragic muse, painted by Reynolds, painted in 1784, and now in the collection of the Earl of Westminister; a third, reading "Paradise Lost," Mrs. Siddons' personal figure; a fourth, as a Lady Macbeth, by Hargreave, which graced her table with a 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.

Memoirs of Mrs. Siddons by Mr. Bouden, were published in 1827, 2 vols. 8vo.; and after her decease, Mr. Thomas Campbell became her biographer. His work, published in 1834, is also in two volumes, and partly compiled from the M.S. notes of Mrs. Siddons herself. There is also a memoir of her in Galv's "Lives of the Players," which, the writer informs us, in a postscript, he had but just completed when he received the news of her having that morning expired.

SIDMOUTH, a town on the Devonshire coast, in the east division of Budleigh Hundred, 134 miles E.S.E. from Exeter. The area of the parish is 1790 acres; the population at the successive enumerations was as follows: 1801, 1252; 1811, 1688; 1821, 2747; 1831, 3126; and 1841, 3306. The number of houses at the last enumeration was 715; namely, 634 inhabited, 77 uninhabited, and 4 building. The memorial of Mrs. Siddons by Mr. Bouden, was erected at the opening of the present Covent Garden Theatre, September 18th. In 1688; 1727, 4; 1794, 100; 1816, 73; 1827, 360; 1841, 2747; 1871, 374; and 1881, 4811. There were in the parish, in the year 1833, an infant-school, with 95 children; namely, 22 boys and 73 girls, supported by voluntary contributions; four day-schools, with 117 children, namely 29 boys and 88 girls (one of these schools, with 40 scholars, being partly supported by voluntary contributions); a boarding-school, with 12 girls; and a parish-school, with 137 children, namely, 100 boys and 37 girls, giving 300 children (namely 302 boys and 158 girls) or rather more than one in nine of the population, according to the enumeration of 1831, under daily instruction. The parish school was also a Sunday-school, attended by 148 children, namely, 88 boys and 60 girls, and there were two other Sunday-schools, with 145 children, namely 45 boys and 100 girls, giving a total of 298 Sunday-schoolers, namely 133 boys and 165 girls, or less than one in ten of the population. (Parliamantary Papers; Ordnance Maps; Lewis's Topographical Dictionary; Lysons's Magna Britannia.)

SIDMOUTH, HENRY ADDINGTON, VISCOUNT.

The father of Lord Sidmouth was Dr. Anthony Addington, a physician, who, after practising for some time with considerable distinction in London, was induced by the state of his health to retire from the metropolis, and to settle in Reading, where he died in 1750. Dr. Addington married in 1746 Mary, daughter of the Rev. Harland John Eliley, of Borrowingtoft, in the county of Lincoln, who died in the 30th of May, 1757, was their eldest son. Mrs. Addington died in 1778. In the beginning of that same year Dr. Addington obtained much notoriety by a strange attempt in which he, his wife, and their two daughters, the first and second attendant of the Earl of Burlington, to bring about a political
S I D

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 amounted to nothing more than a series of expressions 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, 1779, to the office of a resident of the Lord of Lincolns Inn, and in 1784 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 his 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 Pitt, regarded as a promising name in 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 expressed to him, on Mr. Pitt's suggestion, that he stood for and succeeded in getting himself returned for that borough at the general election which proceeded 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 young 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 steadfast supporters. Accordingly, when the office of Speaker became vacant in May, 1780, by the resignation 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 president of the board of trade, which time had been held by his predecessor. He differed, therefore, it now appeared, from Pitt upon the great question of Catholic Emancipation, upon which that minister had gone out; but there is no evidence that any conflict of principle or views had by this time considerably diverged. Addington had come to be considered as the leader or head of the class of persons especially styled the King's Friends; and it was thought to have 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 his 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 the opposition. The occasion 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 upon 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 to the security of the nation. 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 considerably supported by its public opinion, and in 1805, after he had taken 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, ascribes full credit to every other event of any importance in his lordship's career, merely informs 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 taken against Lord Melville:—"During the whole of these proceedings the new chancellor [Addington] has been so pertinacious in adhering to 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 deflection 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 dissatisfaction and disagreement existed between Mr. Pitt and Lord Sidmouth at this period: that the former was jealous of the influence which the latter maintained in a certain quarter, which had lately been manifested in the conferring of high ecclesiastical dignities and that, instead of gaining a useful ally, Mr. Pitt had only exposed himself to the machinations of the individual—that the 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-constructed 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 of the Pitt administration, 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 third time. 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. His conduct on several occasions, as, for instance, on that of the great meeting for reform held in Manchester in August, 1819, 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 all times retained the confidence of the nation. He continued 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 sur- vived till the 10th of August; dying at his residence, the White Lodge, in Richmond Park, of which he was deputy ranger. Lord Sidmouth was twice married; first in 1781, to Ursula Mary, daughter of Leonard Haunmond, of Cheven, in the county of Surrey, Esq., who died in 1811, after bringing him four sons and four daughters; secondly, in 1825, to the honourable Marianne, widow of Thomas Townsend, of Bonington Park, in the county of Warwick, Esq., and only daughter of Lord Stowell, who died also before him in 1842.

(Gentleman's Magazine, for April, 1844.)

SIEGEN, LUDWIG VON, the inventor of mezzotint engraving, was born in Utrecht in 1606, of an ancient and noble family of Westphalia. His mother was a native of Holland, but of Spanish origin; her name was Anna Perer, and Johann von Siegen, the father of Ludwig, was her second husband. Ludwig was the third son of his parents. In 1616 Ludwig's mother died, and his father Johann entered in the following year into the service of Prince Maurice of Hesse and removed to Cassel, where he was placed at the head of the Latin College in the princely residence. In 1634 he became professor of history, and in 1639 of law at the university; and in 1642 he also became professor of rhetoric. He was a very learned man and a capable jurist, and contributed to the development of the science of law in the territory of Hesse. In 1644 he was appointed professor of history at the University of Halle, and in 1649 he was made a member of the Academy of Sciences. He was a very active writer, and his works were widely read. He died in 1681.
ment in the year following, and his successor William V. surrendered the college altogether. Johann von Siegen retired to Juliers and afterwards to Kampen in Holland, where he died in 1655.

It is commonly believed that the death of Ludwig von Siegen from the time that he left the college of Casel in 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 Amelie Elisabeth of Hanau, and in two years afterwards he received the title of Kammerjunker, and served in that capacity until 1641. It was in the 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 importing his secret in Germany. On the 18th of August, 1642 he sent a letter from Amsterdam to the Landgrave, enclosing some proofs of a portrait of his mother Amelie Elisabeth, 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 to further observe, 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 Casel, and a specimen of this engraving is given in La Plaume's Histoire de la Gravure en Manière Noire, (History of Mezzotinto Engraving).

This earliest mezzotinto engraving, though as the above letter shows 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 sold with a pen to the same date; specimens of all three still exist. The incision of the original print was as follows:

Comitissa Hannoverianus, etc.
him on the highest pinnacle of political popularity. The first was entitled "Essai sur les Privilèges," the second and the most remarkable, "Qu'est-ce que le Tiers Etat?" in which he asserts that the "Tiers Etat" is the nation itself; he then proceeded to show, by the most powerful and the most persuasive influence on the government of France, and he demands for it a political recognition. The title of the third pamphlet was "Moyens d'Exécution dont les Réprésentants de la France pourront faire usage pour obtenir l'abolition de l'illimité des nobles;" and it was thought soon became realities through his active influence. On the convocation of the States-General Siewes was elected deputy for Paris. An opportunity for carrying his scheme into effect was now afforded by the second三级 of the representatives of the people to constitute themselves into an independent body, called the National Assembly (June 16, 1789). He it was likewise who proposed the oath which was taken by all the members at the "Jeu de Paume" (Bailey, P. C.) 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 of the state been already paralysed. He was vehemently opposed by Mirabeau (Bailey, 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 Siewes that, on presenting himself before the Assembly, he was hailed and reiterates against the members present, who rose up to receive him. On the meeting of the 23rd of June, when the king declared the resolutions of the Assembly to be null and void, and ordered the members to disband, he pointed out that they were still the same body to-day that they had been the day before, and tidied them proceed in their deliberations. They did deliberate," says a writer in the "Foreign Quaterly Review," "and the resolution was the result." Siewes was also the framer of the decree which was passed on the 30th of October, by which the ancient provinces were abolished, and France was divided into departments all governed by the same law. (France, 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. Acquainted with 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 sullen silence from which even the persuasions of his eloquent colleague, Mirabeau, were unable to rouse him. The most important of these occasions occurred a few days after the taking of the Bastille. 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, the Assembly adhered, and a few days later the Assembly determined to disband and to dismiss the National Guards. He behaved on this critical occasion with his usual coolness, and, as he charged, "the English who live in this country never return, Mr. Poule should return, inform him that I am not at home." In 1796 Siewes was named by the Council of Ancients one of the five directors, but he declined the proposed honour, and Carnot was appointed in his stead.

In 1798 Siewes was sent on a mission from the French Government to the court of Berlin, in which, though he failed in his attempt to bring France and Germany to a reconciliation in securing its neutrality. On his return to Paris the following year he was named member of the Directory, a nomination which showed the disposition of the councils, as he had openly expressed his disaffection with the directory government. Placing himself at the head of a conspiracy which had been formed against three of his colleagues, who were known for their republican sentiments, he procured 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 which the author of "La Fuite" held "in the very centre of those exactions of the Revolution. These measures, as they destroyed the popularity of the author of the Tiers Etat, and exposed him to the vengeance of republican fury, made him anxious to secure political and temporary safety, and to turn his talent and energy to take upon himself the sole direction of the affairs of state. 'We must have no more dealings with declaimers,' said he, 'we want a head and a sword.'"

In 1798 he was appointed one of the six delegates to the newly organized Military chiefs that were to be the executors of the laws of the highest renown; but they appeared to Siewes to fail in the necessary requisites for a civil ruler. Jouber, in whom he hoped to find them, had recently fallen at Novi. Masseau and Desaunay, the Jacobin generals, and Couthon and Collot were too well known for their democratic sentiments. The arrival of Bonaparte from Egypt (Bonnare, P. C.; Kléber, P. C.) determined the difficulty; the penetration of the }
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 sympathy of some of his old associates, and by the active  operation 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 and visionary character of his theories was probably appreciated the English but as children in the art of framing a constitution, and that he considered himself capable of giving a much better one to France. (Dumont, *Souvenirs de Mirabeau*, p. 60.)

Sieyes was probably more successful as a political philosopher than on one occasion he remarked that the art of government was a science which he considered he had brought to perfection. This disposition may have been the cause of many of his crude measures, the necessity of co-operation with the state, and the statesman perceived that a salutary change could not take place without the strong support of the People. 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 constitution 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 his disgust, he found that nothing, respecting the Tribunate, which he thought should 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 determined opposition. Discontented with the overthrow 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 Crome, which was afterwards exchanged for a magnificent hotel in Paris, and the valuable lands of Falsudrie 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" (Allan). This writer quotes also from the "Memoirs of Gohier" an incident characteristic of the extreme cupidity of Sieyes, to use no severer term (History of Europe, vol. iii., p. 785), 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 evinces throughout his Memoirs much personal hostility towards him.

The 1st consul 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 had the talent to translate into acts many of his political ideas formed 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, thirty years afterwards. He died at Paris, in tranquill obliquity, on the 20th June, 1836.

The character of Sieyes has been graphically depicted by Dumont (Dumont, P. 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 had given him the reputation of an established president; he that was put upon the oracle of the Tiers Etat, and the most formidable enemy of privileges. He was easily excited to a display of ill humour, and appeared to hold in extreme contempt the existing régime of society, and the institution of liberty necessarily a liking for the English nation, and the subject being familiar to me, I introduced it to him, but I very soon changed the subject. Of the English constitution was in his eyes a mere piece of charlatanry to impose upon the people: he seemed to pity my ignorance as I described the various modifications that system had undergone, the immense strides it had made. He was of opinion, that towards each other by the three orders of the state, the hidden checks which they opposed to each other's movements, and the disguised but real dependence which existed between them. The influence of the Pope and of the King tended to impress them, the opposition a mere court trick ("manque 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 concerning the whole system of parliamentary government. He thought the English but as children in the art of framing a constitution, and that he considered himself capable of giving a much better one to France. (Dumont, *Souvenirs de Mirabeau*, p. 60.)

Sieyes, no doubt, was a man of great ability, a warm and ardent supporter of the revolutionary principles, and a most formidable exponent of them; but he was also a man of an extraordinary independence of spirit, and in all his political speculations a child of the Revolution; that is, a man who lived and spoke only according to the ideas of the time in which he lived. Situation and opinions of course, are, with all men, the necessary consequence of the way in which they have been brought up. There is also an admirable sketch of his character in Mignet, *Hist. de la Révolution*, c. ii.


His speeches are printed in the "Moniteur" of the time.
England, low, the they clear 'corner'
gives 360 to with
the cattle
and
sea
however
The risk extends to the
coast
much and
The vessels
and
The waters is
underground, and it is generally
found that cattle avoid it in pastures. The species of this
genus are not numerous. They are principally found in
Europe, and will grow in any common garden soil, and may
be propagated by seeds or by cuttings.


SILVER, GERMAN. [Gilding, P. C., p. 504.]

SILVINGUM, a genus of composite plants belonging to the
tribe Cynareae and the section Silvenses. It has an imbricated
involucre, which forms a loose, spreading spinous receptacle. The
fruit is scaly. The fruit compressed, its terminal aroela surrounded by a papillose ring.

S. maximus, is the only species. It has a stem from 3 to 4 feet high, and is covered with the
involution of the involucral scale closely adpressed below. The florets are purplish, with a brown tube. This plant is found in waste places in
Great Britain.

(Babington, Manual of British Botany.)

SINDE or SCIINDA is that part of Hindostan which exten-
s the province of North and is bounded on the north by
the junction of the Indus with the Jamna. Its
area is
76,000 square miles, of which more than
10,000 is occupied by water.

The Indus. Sind is indebted for its fertility to the inundations of the Indus. As far as these inundations extend, the country yields abundant crops; where they cease, and no means of irrigation are used, the country is a desert. These inundations however are not derived from the same cause as those of the Ganges. The inundations in Bengal are almost entirely the effect of the periodical rains during the south-ea
windy season, while the Indus, in addition to the waters receive from the melting of the snow in the Himalaya mountains, is comparatively small. The waters of the Indus are very little increased by rains, as the rains which fall in its basin are principally used in supplying the waters of the rivers of the Punjab, the addition of which makes the waters receive not from the snow, but from the waters of the
Indus.

As in these parts the difference of the snow-line in summer and winter amounts to 5000 feet, an immense volume of snow must annually be dissolved, and the water thus produced must greatly raise the level of the river. Even in the lower course of the Indus the difference of the level between the highest and lowest points amounts to 12 feet. As the banks of the river in very few places attain such height, the waters spread over the adjacent levels and fertilize the soil.

Artificial means are employed to increase these advantages, especially canals and dams. The canals serve two ends. The river is carried to high grounds by means of the inundations; and where they do not naturally disperse over the adjacent country, they are conveyed there by means of the feminist wheel. These canals are only full during the rainy season, the waters of the Indus being dry in winter. The dam are made across the bed of the river, and are of
two different descriptions. Many of them have an opening in the middle, by which all the water escapes when the river is low, but which is covered and stopped up when the volume of water is great. The water thus impeded accumulates above the dam so as to cover a large tract of country. In those parts of the river however which have risen during the rainy season the water receives only a small amount, the water, the dam 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 which is carried by 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 bunds.

The river begins to rise in April. Early in May the swell of the waters begins 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 ripen and are cut down in October. At the end of September the waters begin to recede, and in October the waters of the Indus are at low

A few miles below the point where the Indus is joined by the Jamna, the river enters Sind. About 60 miles lower down, and only about 24 miles above Buhur, it begins to divide into branches. About 10 miles below Buhur it 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 hand was erected across the Narra, near the ancient town of Arore, which is still called the Arore Bund. Thus the Narra was deprived of the annual supply of water, except when the water in 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 parallel to the Garha and Chhina rivers from the vicinity of the town of Arore, and in which running water is found during four or five months of the year. This depression, being considerably lower than the flood-level of the above-named rivers, receives a good deal of water from them through canals and becomes a small stream, and which sends two branches to the Poornam under the name of Goomeer. After this accession of water the Poornam has a well-defined channel from 12 to 20 feet deep and from 600-
The artesian well water is gaining importance in some of the towns of the state. The water table is shallow in the plains and mountains, and the artesian well water is of high quality. The water is used for irrigation, drinking, and industrial purposes. The artesian wells are dug by the villagers and are maintained by them. The water is stored in tanks and used as required. The artesian water is free from contamination and is considered to be healthier than the surface water. The artesian wells are an important source of water in the desert areas of the state.
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-western monsoon, which is, often over 150 miles in length, 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 Bukhar, and extends on the west of the river. The banks of all these canals are fringed with a broad agricultural hand, on which numerous large villages are built, many of which contain 500 houses. Besides fertilizing the land, these canals afford the means of hydrography, and are taken as a work of art. In the fair season, when dry, they become the beaten path of the people and are excellent cart-roads. Beyond the reach of the water of the canals, the country is very little cultivated. Though the components of the soil do not differ from those of the cultivated tracts, it is 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 between thirty feet high, which gradually assume the appearance of a desert running imperceptibly into the Thurr. Only at a few places grain is cultivated, as its growth depends on rain, which is very uncertain in these parts of Sind. The lower parts of the non-cultivated ground are generally overrun with tamarisk jungle.

The country south of a line drawn from Hyderabad to Qandahar, and which runs through the channel of the Indus, generally resembles the region just noticed. In its most northern corner, where the Indus and its Falaloo branch run nearly parallel, is a low ridge of rocks which extends for some distance, and on which are seated small and 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 Sutu and Pigharoe branches. Between the Pigharoe and the Poornua 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 Goomar river. Towards the south-west is a large desert, resembling the Rann. There are hardly any plants met with, except a saline plant called dorse, 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 Keree mouth of the Indus to the north-eastern part of the peninsula of Gujerat, a distance of about 200 miles; in breadth it is about 35, 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 country, bathed in the sun, 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-western monsoon, and banks of all the canals, and the common level of the sea, it is lower than the adjacent country. The southern banks are in many places very fertile, often sandy, and in some parts alluvial. On these waters of the Goomar, and on the valley of the Indus, there are tanks of rain-water, within 200 yards from the Rann itself, retain their sweetness for many months. There are some islands in it where fresh water occurs, but it is scarce. By some the Rann has been called a marsh, but it has none of its characteristics: 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 alimy, is hard, dry, and sandy, and of such a consistence as never to become clayey; nor is it otherwise funny 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.

The climate of Sind differs greatly from that of other parts of Hindustan. Though the south-west monsoon commences in June, its breezes are not strong until the end of August, and the cold season is therefore much prolonged. The heat of the winter becomes intense in 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 which produces a heavy mist or 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 pampers of Buenos Ayres, appear to be the natural effects of the desert countries surrounding Upper Sind, over which no violent wind can pass without raising clouds of the shifting sands which cover their surface. The heat of Upper Sind 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 southern breezes are at times so strong till midnight, but the mornings are generally cool. During the hot season the whole country, except the green forests of balsoo which skirt the banks of the Indus, presents a most arid appearance. With it only rains, which by the general rise of the river laying 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 to the end of February, the climate of Upper Sind is pleasant and salubrious. Frost is occasioned by the occasional return of the cold air which assumes the appearance of winter in the northern climates. The setting in 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. Some have supposed that Sind comprehends the whole of this effect, not only to the European, but the native constitution, and during certain periods of the year exposure to it is as much as possibly avoided by the people of the country. It is only lately become accessible to Europeans, we have not yet received any series of meteorological observations extending over a whole year. But we have observations made at Kurachee on the sea-shore, and at Sukkur in the Indus, for five months in 1844, and the result of them is very interesting.

**KURACHEE.**

Average Heat.

At noon. At 3 p.m. At 9 p.m.
May, 82° 88° 94°
June, 87 93 99
July, 83 89 99
August, 84 91 96
Sept., 77 81 83

From this table we learn that the climate of Sind is really hotter than in those parts of Hindostan which lie in the vicinity of the equator. The difference between the temperature of Kurachee and Sukkur ought also to be noticed. In the last-mentioned place the thermometer rises at noon to nearly 94°, but is a few degrees higher, though Kurachee lies nearly four degrees nearer the equator. This difference is to be ascribed to the desert countries by which Sukkur is surrounded. At this place the heat of 9 o'clock in the afternoon during the hottest part of the day only reaches 84°, whereas at Kurachee it is 94°. This difference is so intense that at noon. This is solely to be ascribed to the hot southerly winds, which invariably continue to blow with considerable force till midnight.

**Production.**—Sind is rich in productions. Though its botanical wealth is not great, the agricultural productions are numerous; all the grains and pulse common to India are grown. Rice is the staple in the delta and in the country between the Western Narra and the Indus, but in the other parts wheat and jowar (large maize) are most extensively cultivated; next to these Holcus sanguineus and Phaeaceus mango. Barley is grown in some districts; other articles are, Phaeaceus maximus, Erynum levis, Panicum italicum, and Cicer arietinum. Indigo is largely grown in the north-eastern districts, but it is inferior to that of Bengal. Oplum is cultivated near Shikarpore, and in some other districts.

The sugar-cane is pretty generally grown throughout the whole of the province, but its production is inferior to that of Northern Hindostan and the Punjab. Cotton is cultivated everywhere, but the quality in the north is superior. The cotton cloth of the country is grown in the vicinity of Khyporo. Hemp, cucumbers, water melons and musk melons, are extensively cultivated, as are also cucumis and anise. There is a great variety of greens grown in the country, and among the boiled vegetables, which grow spontaneously, are purslain and a species of amaranthus. The gardens produce carrots, turnips, radishes, onions, and several kinds of pumpkins, the egg-plant, three kinds of beans, peas, the *Admersonia charantia*, dill, and mustard.

The root of the lown, which covers a great portion of the Lake of Munchar, is eaten. Sesamin, garum, garci- cus, 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, pista, and coconuts, several kinds of wild plum, and the tamarind, but most of these fruits are indifferent, and much inferior to those of Cabool, about Shikarpore and Bokhna. 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 tamarind is the most abundant production of the cultivated parts, 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 amla. When dried and preserved 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 fuel, and it is in the construction of houses, boats, and agricultural implements. The boughs are used for fences and cattle-sheds, to line wells and to catch houses, and are plaited 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 conveyance 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 and inconstant, but harsh and spirited. There are not very many and 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 they are penned. There are five very important articles 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 Shikarpore.

Fowls are plentiful in some places; and tigers, wolves, jackals, wild hogs, porcupines, deer, and hares live in the woods. The tiger is only seen north of Bokhur. 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 Afghanistan. Snakes, scorpions, and centipede abound in rocky situations. Among the birds are a peculiar kind of myraptor, or bee-eater, the black partridge, the grey plover, the quail, two kinds of woodpecker, the razor-beak, several kinds of gulls, the pelican, and a species of plover. Geese, ducks, divers, and the black water-fowl are plentiful at the banks of the Indus and those of Lake Munchar, as also on the swampy grounds; they form part of the food of the lower classes.

Fish abound in the sea, the Indus, the lakes, and the fisheries in the river and at its mouths are extensive, especially on the Gora Bank. The fins of small sharks, which abound near the Indus, form an article of export to China. As the three-fifths of the fish of the delta have been killed, the most important is called *polua*, and is a kind of carp, which is of delicious flavour, and caught in great quantities, but only in the four months that precede the swell of the river.

In the Murree and Boogtee hills, a spur of the Sulimian 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 portion of any kind besides waterstone, procurable in the Indus and Burce is found in the level parts of the country.

**Population and Inhabitants.**—Sind is a thinly peopled country; the whole population is stated not to exceed one million, but it appears to be underestamped. The greatest part is a desert, on which only some nomadic tribes wander about with their herds, and the bulk of the population is settled on the banks of the Indus and on the canals which are fed by its waters. The best populated districts extend from Shehwun on the south to Bokhur and Shikarpore on the north.

The population is divided into three distinct classes, the Sind ee, the Bheeleh, and the Hindu. The Bheeleh form the bulk of the population, and are divided into the lower and upper classes, and the former, who are generally termed Bheels, or Boolehooos, form the bulk of the people. The Hindu amount to about 200,000, and are divided into two classes, one of which consists of the Hindus proper, and is occupied chiefly in trade; the other is formed by the large number of traders and adventurers who have abandoned their occupation. In this last, however, have managed to make their way into the midst of the Bheels by degrees, and have formed a sort of a middle class, from which they gradually descend to the common herd of the people. The Bheels are divided into four distinct tribes, the individual members of which are connected by relationship, but the whole body is composed of a Hindostan and others which are termed Bheels, from the being the sole property of that nation. The Sind ee are the less fixed part of the population, 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 Bheels settled in Sind preserved their language, but the Sind ee, who have been鞑靼ized and who belong to a degree of wealth and considerations, the Indus was taken possession of by the British, but they are now entirely entitled to the greatest part of these classes and tribes are dispersed over the plain which lies between the Indus at Bokhur and the Beeman Pass, where till of late years they much impeded the passage of the caravans by their depredations. Some of these clans however have abandoned their wandering life, and become cultivators of the ground. The Bheels have adopted the language of the Hindustan, which however is considerably mixed up with Pushtoo and Peshawar. The language of the Bheels is quite different, and almost written in another alphabet. The Sind ees are a mixture of Guzeratees, Tamul, and Munsali and a corrupted Marwari. There are no colleges, libraries, or public schools in Sind, but the higher classes are well versed in Persian literature, and read and write that language.
Divisions and Towns.—Sinde is divided by the natives into two parts: Lar, which comprehends the southern portion as far north as Sehwan; and Sirra, which extends over the northern districts. Lar contains the three seaports of the country—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. Vikur, situated on the Hojammoo mouth, 55 miles from the sea, is a fine river being navigable to the place for more than 35 miles for sea boats of 40 tons burden; it exports the produce of the delta. Kurachee, on the west, and about 30 miles from the mouth, is the metropolis of the Indus, the Pittar. Built on the bank of a creek distant from the sea; a little market. A harbour, at its entrance protected by a high headland, affords safe anchorage at all seasons to vessels of 2000 tons, from its fine, large coasting barks. 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 Bunder, the present capital and seat of the government, is built not far from the east bank of the Indus, between the Chiver and the Feroom, on a rockyeminence. 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 Hojjamoo mouth of the Indus, is the town of Euphrates. town of Shikarpore, is washed by the river, but is now five or six miles distant from it. It presents only a heap of mud ruins, and at present contains scarcely 8000 inhabitants. Some good cotton fabrics are still made here. An ancient hotel, or house of boats, is the town of Furrat, and Sirra, on the western banks of the Indus, is the town of Jurruck, which is built on a hill 150 feet high, has a good bazaar, and 4000 inhabitants. Moepore is built on a canal which runs eastward from the Indus, forming a branch into the interior and fertilizes a very large tract of country. This town has mud walls enclosing a circuit of three miles, and contains 10,000 inhabitants. There are more than 300 shops in the bazaar. It was founded by the last Ameer of Sirra, and is built near the edge of the Thurt. It exports the produce of the desert, and contains 2000 inhabitants, chiefly Rajpoots.

Sirra, or Upper Sinde, contains several large places, especially the west of the Indus. Sehwan, a large and formerly an important commercial place, is built on a rocky eminence not far from the place where the Arrul, or Western Nara, river joins the Indus. It contains between 10,000 and 12,000 inhabitants, and carries on an active trade with the fertile country to the north. The road between Kurachee and Shikarpore passes through this town. On the banks of a canal, 3 miles from the town, is the town of Kyrhojan, which has seven mosques, and between 2000 and 3000 inhabitants, and is a thriving place. Further north, on another canal of the Western Nara, is Larkhana, situated in a fertile plain, is an important place, and contains about 2000 inhabitants, and is exporting in large quantities; it has 12,000 inhabitants. Shikarpore is the principal emporium of Sinde. [SHIKARPORE, P. C. S.]

On the eastern banks of the Indus stands the town of Roeo, which is built on a rocky eminence, and contains about 8000 inhabitants. The streets are narrow and the houses built of sun-burnt bricks; many of them have three or four stories. Opposite this place, on an island of the river, is the fortress of Bukkur, and on the other side the small town of Sukkur. Kyrhojan, built on the canal of Meerwah, is a miserable-looking place, but it has for some time been the residence of one of the princes of the Talpore family; it has 18,000 inhabitants; the bazaar is spacious, and in the centre of it was the chief's residence. Subulcote lies on the road leading from Roeo to Bawulpore; it has some trade in the produce of the country, especially grain, hides, and opium.

Manufactures.—The manufactures of Sinde are not numerous; but they may be considered extensive, when the scarcity of the population is considered. Cotton-cloth of a coarse description is manufactured in the principal towns and villages, chiefly for home consumption, and a little is exported to Afghanistan and Persia. Among the silk manufactures there are several different kinds; the best are those called the laris, a rich fabric of silk, cotton, and gold, variegated in pattern and of close texture. Common laris are fabricated in the villages of Raneepore, Gumbat, Khooor, and Duroo, situated near to one another, south of the town of Kyrhojan.

They are chiefly of cotton with silk borders, or a few of silk and cotton mixed, and inferior to those of Tatta and Bawulpore. Some silk cloths for the lower classes are woven at Roeo, Kyrhojan, Shikarpore, and Sehwan. A peculiar kind of caps called Shoojahs, are used by all people, and are chiefly made at Shikarpore, Roeo, and Sehwan. In Lower Sinde are numerous tanneries, in which good shoe-leather is made. Shoes are exported to the neighbouring countries, but they are inferior to those worn by the British. There are manufactories of paper and gunpowder in all large towns. The best paper-manufactories are at Shikarpore and Larkhana, but their produce is inferior to that of Cashmere and Jaffn," said the British commander.

Commerce.—When the British occupied the main part of Sinde, it was concentrated in that of Sinakooran, under which an account is given of it. Roeo parts of the commerce carried on between Shikarpore and Bawulpore. Kurachee has some commerce with Arabia and Persia, and we have no account of its extent and the articles of export. A commercial relation between this place and Bombay has lately sprung up, which probably will become of importance.

History.—Sinde became known to Europeans by the expedition of Alexander the Great, who followed the course of the Indus to its mouth, and constructed a fleet, which sailed along the coast and up the Persian Gulf to the mouth of the Indus. Shikarpore was the place where the city of Sambus mentioned by Arrian. [ALEXANDER, P. C., p. 201.] It appears that at this time the country was divided among a number of independent sovereigns. Nothing is known of the political changes that have taken place since the middle of the world before Mahommed of Ghizni conquered a part of Hindostan and subjected Sinde to his rule. Since that time up to the last century, Sinde appears always to have been an independent country, which comprehended all the northern parts of Hindostan. But by the peace, which Shah Nadir concluded in 1739 with the Mogul emperor, Sinde was dismembered from it and became a part of the Persian monarchy. After the death of Shah Nadir (1747), Ahmed Khan founded the kingdom of Afghanistan, and Sinde was annexed to it, but the government of the country remained in the hands of a Belooch family, the Kalhoras, who before that period had settled there and acquired great authority. Among the other Belooch tribes settled in the country was that of the Talporees. Their chief, Byram Khan, was minister of Mirjan Surluxan Khan, the Khalora ruler, and was with one of his sons cruelly put to death by him in 1774. His death produced violent disturbances in Sinde, owing to the extensive influence which he had with his tribe and the country. In 1781 Beur, another son of Byram Khan, shared the fate of his father and the same fate; and also Byram Khan; this exasperated the Talporees, 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. Times were more peaceful during the reign of Shah Nadir, and Sinde was tributary, endeavoured in the commencement of the struggle to restore the Kalhoras, but he had too much to do in the Punjab to assist them effectually, and he thought it prudent to invest the Talporees formally with the government. The Talporees 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 Ameers.

When Shah Shojoah had lost the throne of Cabool, these sovereigns considered themselves as quite independent, and in 1834, when he made an attempt to recover the throne of Cabool, they refused assistance, and opposed the march of his army through their territories. But he beat them in a battle fought seven coins from Roeo, and obliged them to pay seven lakhs of rupees, and to form him the distinction of Shikarpore. Meanwhile Sir Ahmad Shah-Durrani visited Sinde (1831) and a treaty of commerce had been concluded between the Ameers and the British government, by which the Indians were to open Cabool to the British. No advantage to British commerce had resulted from this treaty, when the British resolved to replace the dethroned Shah Shojoah on the throne of Cabool. The Ameers, who were still to be considered independent, opposed the march of the British army through their countries to the Bolan Pass, and surrendered by treaty the fortress of Bukkur and Kurachee to the British commander. When however the British armies in Afghanistan were nearly destroyed...
(in 1841), a spirit of insurrection manifested itself in Sind 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 which were still in their possession, and they attempted to establish a free navigation by a new treaty. The Afghan Government had not the strength to resist the British willing to go back to 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 partly destroy their shikargars along the river. But the British were quite prepared for the change of the arrangements, to their large extent of the shikargars. It was however soon evident that this was only a pretext for breaking the treaty; the narrow track-road along the banks of the river, required for a track-path, would not only diminished the immense extent of their shikargars. The negotiations were speedily 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 Ameers near Meaneer, a place near the spot where the Fulahlee branch leaves the Indus. On the 17th of February, 1843, an obstinate battle was fought at Meaneer, between the British troops and the Beloochees. It was fought with the same spirited resolution with which the Beloochees were completely defeated. They lost 6000 men, with all their artillery and military stores. The Ameers, six in number, came to the British camp and surrendered unconditionally. On the 24th of February, the capital of Gujerat was taken, and the entire 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 followed, especially among some of the most powerful Beloochee 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 have so often conferred on or secured to other parts of Hindustan.

(Burnes' Travels into Bokhara, &c.; Wood's Personal Narrative of a Journey to the Sources of the River Oxus; Hough's Narrative of the March and Operations of the Army of the Indus; Orbelo's Visit of the Towns of Seheleen and Boobuk, &c.; H. Knight's Report on the Arul River, Lake Manchhor, &c.; Macleod's Report on the Nature and Extent of Gobor Creek; Del' Hose's Route from Dihon to Sukkur; Nicholson's Some Account of the Koree, or Eastern Branch of the Indus; Del' Hose, On the Advantages to be derived from establishing a Communication between Kutch and Sind; Del' Hose's Report on the Musumee, in Outch, to Hydabad, the Capital of Sind, &c.; Some Notes on Sind, by Winchester; the eight last-mentioned papers are found in the Transactions of the Bombay Geographical Society, 1844-1846; Hart's Account of a Journey from Karachi to Kingol; Del' Hose's Report on the Country between Kurrachee, Tutta, and Seheleen; and Westmacott's Short Account of Kyppo and the Fortress of Bus, in Journal of Bengal Asiatic Society, 1840; Fawkes' Report on Upper Sind and the Eastern Provinces of Ootchee; Various Routes in Sind, from Official Documents; and Nock's Report on the Road from Sind, from Sukto to Shikarpore, in Journal of Bengal Asiatic Society, 1845.)

SINGLETON, HENRY, was born in London, 1796. His father died while he was an infant, and he was brought up by an uncle, William Singleton, a miniature-painter, who gave him instruction in the practice of Miniature-painting, and also was his intimate 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 drawing of monument in the Academy. He was next in the competition of Mortier's "Odyssey Alexander's Feast." The medal was presented by Sir Joshua Reynolds, the last time but one that he presided at the distribution of the Academy prizes, and he is said on the occasion to have exclaimed, "How much are the prices of Microscopists?" He also was a frequent exhibitor 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 drawing of monument in the Academy. He was next in the competition of Mortier's "Odyssey Alexander's Feast." The medal was presented by Sir Joshua Reynolds, the last time but one that he presided at the distribution of the Academy prizes, and he is said on the occasion to have exclaimed, "How much are the prices of Microscopists?" He also was a frequent exhibitor 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 drawing of monument in the Academy. He was next in the competition of Mortier's "Odyssey Alexander's Feast." The medal was presented by Sir Joshua Reynolds, the last time but one that he presided at the distribution of the Academy prizes, and he is said on the occasion to have exclaimed, "How much are the prices of Microscopists?" He also was a frequent exhibitor 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 drawing of monument in the Academy. He was next in the competition of Mortier's "Odyssey Alexander's Feast." The medal was presented by Sir Joshua Reynolds, the last time but one that he presided at the distribution of the Academy prizes, and he is said on the occasion to have exclaimed, "How much are the prices of Microscopists?" He also was a frequent exhibitor 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 drawing of monument in the Academy. He was next in the competition of Mortier's "Odyssey Alexander's Feast." The medal was presented by Sir Joshua Reynolds, the last time but one that he presided at the distribution of the Academy prizes, and he is said on the occasion to have exclaimed, "How much are the prices of Microscopists?" He also was a frequent exhibitor 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 drawing of monument in the Academy. He was next in the competition of Mortier's "Odyssey Alexander's Feast." The medal was presented by Sir Joshua Reynolds, the last time but one that he presided at the distribution of the Academy prizes, and he is said on the occasion to have exclaimed, "How much are the prices of Microscopists?" He also was a frequent exhibitor 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 drawing of monument in the Academy. He was next in the competition of Mortier's "Odyssey Alexander's Feast." The medal was presented by Sir Joshua Reynolds, the last time but one that he presided at the distribution of the Academy prizes, and he is said on the occasion to have exclaimed, "How much are the prices of Microscopists?" He also was a frequent exhibitor with him.
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 receiver, and 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 density, the quantity of rarefaction is directly proportional to 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 is the same, the indication of the siphon-gauge in relation to 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 of the air in the barometer-tube was taken off, the column of water in the siphon-gauge indicates the height to which 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 two; the height of the column of mercury in the two branches of the siphon.

The Pear-Gauge alluded to in the article Air-Pump, P. C., and a description of which has been inadvertently omitted, was also invented by Smeaton for 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-light 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 it; at which time, evidently, the air in the gauge will have the same density as the air in the barometer-tube. Then, 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 air. 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, as well as the pear-gauge, having been converted into a siphon-gauge, and the air-vapour, is diminished by the partial exhaustion; but, in employing the pear-gauge, which, during the process of exhaustion, contains a portion of the elastic vapour, on re-admitting the air which had been extracted from the body of 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-
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 in Valsugna near Pavia, a spot selected by the young Simondi. Here he divided his time between the active superintendence of his farm and the preparation of a work which he had projected during his travels, entitled "De la Richesse Commerciale, ou Principes d'Economie Politique appliquées à la Législation du Commerce." This work he began to write immediately on his return, and in 1819, published at Paris 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 Wilna was soon after offered to him by Count Plettenier, who came purposely to Geneva to urge in person his proposal. Though the offer was made, as the account which the writer received of it, the acceptance of it on that account urged upon him by his parents, it was declined by him from his dislike to teaching. He was at this period that Simondi began to apply himself earnestly 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 Suel, could not deliver him from the desponding feelings which are so common to the young author, and, to the suggestion of his earnest mother, he was induced, in 1806, to accompany Madame De Stael on a tour through Italy. Sympathy of literary tastes had produced the sincerest friendship between these two distinguished literary persons. The interest of their life was shadowed together in that classical country, and the poetic charm cast upon them by the conversation of the authoress of "Corinne," (Stael, Anne Germaine de, P. C.) fixed the determination of Simondi to induce it in the path of learning and 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, G enerst, is stated to have dealt hardly with him, and the publication of the subsequent volumes, the last of which appeared in 1818, was transferred to Treuttel and Wurtz. A new and more complete edition, in sixteen volumes, appeared during the years 1826 and 1827, both at Paris and Brussels. In the composition of this his first and most important historical work, Simondi has been blamed for his insufficient use of public archives and private collections; he is, however, acknowledged to have carefully consulted every printed book from which he could derive information. It is to this conscientious examination of authorities, the result of personal research, that the value of this work, the "Républiques Italiennes," as a historical truthful record, is chiefly due. The style is pleasing and attractive, but, though a good French scholar, he never hesitates to use an authoritative authority when it is necessary to convey meaning with greater precision. The part of the work, which is generally considered to be most defective, is that which treats of the development of the republican constitutions and institutions in Italy, as both in Italy and France the biographer is not an eyewitness of the events he narrates. The manuscript pages of his history to his mother, and, with the humility of filial obedience, to lend an attentive ear to the corrections she suggested. To her pious care he has gratefully acknowledged the benefit, and not a little of the success he has attained as an author; in his desponding moments she was ever a present comforter, and the rough path to literary fame was softened by her counsels and cheered by her example.

In 1811 he delivered at Geneva a course of lectures upon the Literature of the South of Europe, which were printed at Paris in 1813, and a third edition, in four volumes, was published in 1829. It comprises an introductory history of the decline of the Latin language and the formation of the languages of Southern Europe, and presents us with a history of Italian, Spanish, and Portuguese literature to the end of the eighteenth century. The portion of this work which treats of the literature of Spain and Portugal is the most imperfect, as the information which it contains is derived from secondary sources.

In 1822 he visited Paris, which at that time presented an interesting study for a political observer; he formed an acquaintance with an illustrious brother historian, M. Guizot, who, when, in 1819, he became Minister of Public Instruction, invited him to Paris, where he resided at the Hotel de France, at Paris, which, however, he declined. During the Hundred Days a series of lectures, which he published in the Moniteur, on the French Constitution, attracted the attention of Napoleon, who requested an interview with the author. The interesting details of this interview were immediately after reported by Simondi to his mother, and an abridgment of them may be seen in the article of the "Quarterly Review" referred to at the end of this year.

In the year 1819 Simondi began his longest, and, as it is by some considered, his best work, "L'Histoire des Français," which occupied him till the close of his life. It was not at first the intention of the author to bring down this history to a later period than the Edict of Nantes, which terminates the twenty-first volume; he was induced to continue it, on a more abridged scale, to the period of the Revolution, but he carried it no further than the year 1790. His principal motives for undertaking this important work were, the connection of French history with Italian, and the fact that French literature possesses no history of the kind which can be looked upon as a work of authority. To those motives he added the great interest which Simondi evinced in the affairs of a country which he had adopted as his own. He has not, however, allowed his bias in favour of France and the French to interfere with his judgment; he has been in all respects impartial in the presentation of it. So little indeed did he seek to gratify in it the national vanity, that he has not hesitated to expose the weak foundation on which had rested undisturbed for centuries many traditions and even the authority of a name, and, as far as his account responded to the popular feeling, had been fondly cherished in the memory of the people.

The history is divided into eleven periods: the first the history of the early races of French kings, the Merovingian, Carolingian, and early Capetian races, to the accession of Louis X.; the fourth brings it down to the death of Charles IV., 1328; the fifth, from the death of Philip in Valois to Charles V., 1429; the sixth, from 1429 to 1515; the seventh, and most interesting, presents us with the reign of Francis I., and is a beautiful specimen of historical portraiture, in which the colouring is so perfectly blended with the ideas that the reader is no more exaggerated than the eighth embraces the period of the religious wars of Francis I., which are treated of with an impartiality scarcely to be looked for in a Genevan Protestant; the ninth is the reign of Francis II., and of the death of the young Prince, and the Bourbon, and here, more perhaps than in any other part of his writings, may be seen the honest spirit by which he was actuated; indeed in his endeavour to be impartial, he has perhaps sometimes indulged in an unseemliness, as a consequence of his reverence for the name of Henry IV. The last three periods embrace the history of France under the Bourbons to the latter period of the reign of Louis XV. (Francé, P. C.)

In the year 1830, after finishing, in "Lambert's Cabinet Cyclopaedia," an abridgment, in English, of his "Républiques
Italianians; a French edition of this work appeared in Paris in 1832, under the title ‘Histoire de la Renaissance de la Fabrique d’Italie.’

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 1833, describes the history of 750 years, from A.D. 250 to 1000; the other writings of Sismondi are of the same general nature as described above—albeit an historical novel in imitation of Sir Walter Scott, in which he describes the condition of Gaul at the time that Rome was a great and prosperous city; it was published at Paris in 1822: 2. ‘Etudes sur les Sauvages.’ Published at Paris in 1816, this work contains a collection of articles which he had previously contributed to various periodicals: 3. ‘De la Vie des Peuples de l’Asie.’ Published at Paris in 1807, in 8to.

The above is a brief account of the life of Sismondi; 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 conscious 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 inclination for the trimming of the garb to which he had marked out for study, usually nine or ten hours a day. The time be allotted to this object was never broken in upon, except to assist a friend or to alleviate misfortune. As a public character he displayed no indifference to the matters of his national politics, and he was careless of the unpopularity which this conduct often entailed upon him. About the year 1840 he felt the first symptoms of the cruel malady to which he fell a victim, which was a 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 never spared himself to the point of death. 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 Francs.’

Sismondi married, in 1819, Miss Allen, sister to the late Mr. Allen of Crastilly, member of parliament for Pembroke, 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 Francs,’ will be found an interesting supplement to this biographical sketch of Sismondi:—‘My life has been divided between the study of political economy and history; in this last, the current of events is not 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 formation and renewal of the human and political societies; Subcutaneous Ichthyosis, Argenteum. above all, I have always looked upon wealth as a means, not as an end; I have always inquired respecting it, whether it really advanced the well-being of all classes, and I trust my readers will discover that I have taken in the welfare of the cultivator of the land, 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 only arrange them in the alphabetical order, 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.


Order 4. Pustulosis. Verruca, Varicela, Varicium, Vacci-...
extensive, and the tendency to inflammatory action in the skin so strong as to produce pustules instead of vesicles. Such are the three forms of Eczema, usually described by writers on diseases of the skin—E. solaris, E. rubrum, E. impetiginosus. Eczema is more likely to be confounded with itch than any other disease, from which it may be distinguished, among other causes, by the catabrosis of the person attacked, which is called E. mercuriure.

The treatment of Eczema must be adapted to the causes which have produced it. According to the general state of health, and the duration of the affection, the treatment may be either acute or chronic. In slight cases of acute eczema require only a simple treatment, a light diet, saline purgatives, and cooling or emollient applications to the part being all that is required. In some cases the inflammation is great and the pain intense, and where this occurs bleeding and a more active general treatment should be had recourse to. Chronic eczema is much more difficult to treat. The general health demands attention, and alternates and tonics, according to circumstances, are demanded. Astringent lotions and ointments, such as the preparations of silver, zinc, alum, &c., may be used; sulphurous baths, and various mineral waters have also been recommended in chronic cases of this disease. The tincture of cantharides and the preparations of arsenic have also been employed in the chronic forms of eczema.

Millaria (Fibris milliari, Millary Eruption) is also a vesicular affection, and is characterized by multiple small pustules. It is accompanied with inflammation of the gastro-intestinal mucous membrane, and is accompanied by profuse sweating. Millaria as an epidemic and independent disease is only seen between the 45th and 48th degrees of latitude, and its existence has been doubted by some nosologists. It frequently accompanies other diseases, and retires with the cessation of the disease which it attends. When the fever accompanying it is slight, the treatment is a gentle and purgative diet. As demilements will be found sufficient. In the epidemic form however it is often a formidable disease, and requires the same treatment as other epidemic contagious fevers.

Rupia is a bilious disease accompanied with small bullae, the bases of which are inflamed. The bullae are not numerous but flat and full of a serous fluid, which becomes thick, puriform, or sanguinolent, and drying up forms blackish thin or prominent crusts. It is commonly developed on the legs, sometimes on the loins or thighs. It attacks children that are of a delicate constitution, and persons weakened by other diseases. The scrofulous are peculiarly liable to it, and it comes on after hard living, insufficient food, exposure to cold and violent courses of life. It is generally indicative of an imperfect state of nutrition, and the treatment consists not so much in applications to the diseased skin, as in giving tone to the system by nutritious food, and tonic and alterative medicines.

Ecthyma (Pustulosa Scale) is a non-contagious inflammation characterized by large pustules raised upon a hard circular base, and covered with a crust. The pustules are of such large size, the phlyaxis of Willan, so that ecthyma bears the same relation to pustular diseases that rupia does to vesicular ones. In some stages in fact it is difficult to distinguish one of these diseases from another. Willan describes four varieties of ecthyma, but Rayer recognizes but two, acute ecthyma and chronic ecthyma. Acute ecthyma is a comparatively rare disease; it generally appears on the neck and shoulders, and runs its course in a few days. In this form it requires little treatment; light diet, diluent drinks, milk purges, and warm or cold applications to the part will suffice.

There are the same kinds of symptoms which discharge their contents in the course of two or three days, leaving behind them thick brown adherent crusts, which sometimes fall off, leaving an ulcer behind, but more frequently remain adherent. To form may be gradual or abrupt, and is usually produced by some external agent, and is simple or syphilitic and cutaneous, and is frequently modified by a syphilitic taint. Just in proportion to the intensity of the constitutional derangement will be the duration and extent of the eruption. In its treatment the general health must be especially attended to; it is a more disease indicating a want of action than of increased action, and alteratives, tonics, nutritious diet, change of air, and sea-bathing are more beneficial than any other kind of treatment.

Acne (Guttae roseae, Rose-Drop) is a chronic inflammation of the skin characterized by an eruption of small pustules surrounding a hard and inflamed base. They are generally observed on the face, neck, and shoulders, and are frequent on the arms and neck. The pustules are sometimes single, constituting the simple form of the disease; at other times they become hardened and the whole skin becomes red, where the disease takes the form of a red eruption, which is often seen in the oil-tubes, and arises from an obstruction to the performance of its functions, which produces inflammation. The oil-tubes of the face are very liable to obstruction from exposure to the air and atmospheric changes, and may be frequently 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 mappet. They were at one time supposed really to possess some medicinal virtue, but this is now considered by some to be the case with the mares of oil in question, it is now known that a little acrid takes up its abode in these oil-tubes, and is well known to zoologists under the name of Demodex Folliculorum. 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. In those cases where the disease is caused by cold, sodium, and mercury, have been found most efficient. Where the face is much swelled and inflamed, fomentations will be of service previous to the use of the astringents.

Lichens which are produced by the simultaneous or successive eruptions of red itching pimples, scattered or disposed in groups over the whole body. It is in the adult which Strophulus is in the child. [BRITAIN, E. C. G.]

Diseases of the skin are very numerous and peculiar, but 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 food, which supplies the skin with all the necessary ingredients; warm clothing, especially during changeable and cold weather; constant and regular exercise, so as to keep the skin as an excretory 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 a 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 coruscate segment less than a hemisphere. [ESTIMATION OR OBJECTS, F. C. B.]

The earth is surrounded by the atmosphere, which is charged with vapours and terrestrial particles; and by the reflections which, in consequence, the rays of light experience in passing to the spectator, the sky assumes the variously coloured tints which it is so often described as having.

It is known from many experiments that pure air is devoid of colour; and the observations of M. de Saussure (Voyages dans les Alpes) have established the fact that, in an atmosphere unmarked by the presence of smoke, the sky is blue. The height of the sky, which is equal to the space visible, then seems to us to extend in all directions above the highest object which is visible, whether this object be a mountain, a cloud, or a cloudless space of sky.

When the sun has considerable elevation, the rays of light which in this part of the atmosphere are almost parallel, but diurnally 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 rays which are more refrangible than the red, are bent, while the 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 remote 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 greater obliquity upon the parts about the sun, 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; and hence it is that the blue tint of the sky is found to increase in intensity as the spectator ascends above the general surface of the earth. On the top of high mountains, at a distance of several miles from the horizon, one can observe the blue rays which, after reflection in the atmosphere, enter the eye is very great; and the blueness at length becomes a deep blue-ground on which the stars appear to shine at all times. At the appearance of the moon, is marked by the absence of the moon. It is hence evident that if it 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 a cloud.

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 polarized: this quality in light, being a result of its reflection. Dr. (Sir David) Brewster, who has been so much interested in the subject, considered that the light of the sky consists of two parts, one blue and the other nearly without colour; and he discovered that these have different directions of polarization. (Treatise on New Philosophical Instruments, p. 946.)

The hypothesis that the saure colour of the sky is caused by reflections of blue rays, was at one time objected to on the ground that the shadows of opaque 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 Sasaure, while admitting that he has often perceived the shadows of objects to be bluish in the mornings and evenings on the general surface of the earth, states that in alpine regions, where the sky is intensely blue, the shadows of objects never appear to be so: he adds that, of fifty-nine observations made for the purpose of ascertaining the colours of shadows on the mountains, thirty-four showed them to be a pale violet, eight showing them to be black, six a pale blue, and once they appeared to be yellowish. It may be inferred, therefore, that shadows cast by opaque objects are so much affected by the colours of the neighbouring objects that the blue shadow of an object is thrown by stars, which they receive from the light of the sky. [ACCIDENTAL COLOURS, P. C. S. To the like interference must be ascribed the variously-colored shadows which were observed by M. E. Chevreul and M. M. Berlio, Mémoires de l'Académie des Sciences, 1748.]

Between the tropics the transparency of the atmosphere is far greater than it is, in general, in regions beyond them towards the north and south. For in the northern and southern parts of the earth the sun is almost always above the horizon, and the light which it gives is strong, and the atmosphere is thin:

For the description of an instrument invented in order to ascertain the intensity of the blue colour in the sky, see CRANSTON, P. C. S.

SMEDELEY, EDWARD, Reverend, was born about the year 1783, and was the son of the Rev. Edward Smedley, who had been the head of Westminster school for nearly half a century. The elder Smedley was the author of 'Eriu, a Geographical and Descriptive Poem,' published by subscription in 1610. His son was educated at King's School at Westminster in 1800; and thence he removed in due course to Trinity College, Cambridge. He took his degree of B.A. in 1809, as tenth Junior Optime, and, having obtained one of the Member's Classical Prizes, he was elected to a fellowship at Sidney College. He obtained no fewer than four of the 'Scotoamian Prizes for English poems; the first on the Death of Beau and Jonathan, 1814; the second, on Jephtha, 1815; the third, on the Marriage at Cana, 1827; the fourth, on Saul at Endor, 1828.

In 1829, he was called by Bishop Tomline to a prebend in the cathedral church of Lincoln, the value of which, however, was only 14l. a year; and this was the only ecclesiastical preferment he and England. Besides his Satyric Prize poems, he was the author of a poem entitled 'Prescience,' and of some others; and also of a 'History of the Reformed Religion in France,' in five vols. 8vo., and of one volume of his History of France. He contributed several articles on French subjects to the Edinburgh Review, and to the superintendence of the Society for the Diffusion of Useful Knowledge. At the time of his death he was editor of the 'Encyclopaedia Metropolitana,' and he contributed several articles on French subjects to the earlier volumes of the present work. His death took place at Dulwich on the 29th of June, 1836.

SMIRKE, ROBERT, R.A., of Greenwich, is the Nestor of the Royal Academy, of which he was a member for fifty-three years, died at his house in Ordnborough Street, Regent's Park, January 5, 1845, in his ninety-fourth year: he was born in 1724.

Smirke, originally a painter of coach-panel, was one of the most distinguished of the English genre painters, and had indeed no great rival before the time of his rise. His subjects are various, but his favourite subject was Cervantes; a great proportion of his pictures are from Don Quixote. Though so long a member of the Academy, he sent few pictures to its exhibitions, and only three before his election as a member, which were The Soldier, The Widow, and The Tournament, in 1796; and the Widow in 1797. He was elected an Academician in 1792, the year that Reynolds died, and he may be said as his presentation picture to the Academy. He contributed two pictures also in this year to the Academy exhibition: The Lover's Dream, and Musidora, from Thomson's Spring and Summer. In 1793 he exhibited The Battle of the Nile, from the Autumn of the same poet. Smirke designed much for booksellers, and for annuals and such works, and he was one of the contributors to Boydell's Shakespeare. He painted several pictures from Shakspeare, as Catherine and Petruchio, Juliet and Nurse, Prince Henry and Falstaff—'This chair shall be my state, this dagger my sceptre, and this cushion my crown!'—The Seven Ages; and others. From Don Quixote he painted Sancho's audience of the Duchess, The Countess Dolores discovering the cause of her grief to Don Quixote; The ceremony of board-washing performed by Don Quixote at the table of the Duke; Don Quixote addressing the Princess Dulcinea; and The Combat between Don Quixote and the Giants interrupted by the Innkeeper. The last time he exhibited was in 1813: the picture was styled 'Infancy.' In other classes, the following pictures are among his best works: The Infant Bacchus, which he formed of the coloured localities, the justifying Providence, from Farnell's Hermit; the Gipsy; the Fortune-tellers, &c. &c. Smirke was the contemporary of Sir Joshua Reynolds—he was the father of the present Sir Robert Smirke.

SMITH, SYDNEY, Reverend, was born in 1768, at the village of Woodford, in Essex. His father was a gentleman, whose residence was at Lydiard, near Taunton, in Somersetshire. Sydney was a very extraordinary boy, and always serene and intensely blue, while the clouds near the setting sun are brightly tinted with the prismatic colours. The skies of the south of Europe and some parts of North America are distinguished for their serenity and beauty; but, in these respects, they are said to be inferior to the skies over the islands in the Pacific Ocean.

The description of an instrument invented in order to measure the intensity of the blue colour in the sky, see CRANSTON, P. C. S.
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Smith while in Edinburgh officiated at the Episcopal chapel there. In 1803 he removed to London, where he married the daughter of Bishop Pilkington, the Bishop of London, and resided in 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, Albemarle Street, and was a regular contributor to the 'Edinburgh Review.'

Lord Erskine, when Lord Chancellor, gave him, in 1806, the rectory of Foston, in Yorkshire. In 1812 he was presented to the living of Waddington, by Lord Lyndhurst, and in 1831 he was appointed by Earl Grey one of the canons residentiary of St. Paul's Cathedral. Except a few years when he resided at his rectory of Foston, and during which his family was in the Hebrides, he remained in London, on the Subject of the Catholics to my Brother Abraham who lives in the Country, by Peter Plymley, his place of residence was London, where he associated with literary men and politicians of Whig principles, distinguished for his conversational powers, and consequently a frequent 'dinner 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, 1844, 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, M.P.

The Rev. Sydney Smith published 'Six Sermons,' Edinb., 12mo., 1800; 'Two Sermons,' 2 vols. 8vo., Lond., 1809; several occasional sermons and political pamphlets; and contributions to the 'Edinburgh Review.' In 1812 he published 'The Standard,' a monthly journal. He afterwards published his 'Pensioners,' 'The Works of the Rev. Sydney Smith,' 3 vols. 8vo., with a preface by the author and a portrait. The collection consists of his contributions to the 'Edinburgh Review,' Peter Plymley's Letters, and various occasional tracts. With respect to his contributions, he observes, 'I see very little in my reviews to alter or repent of. I always endeavoured to fight against evil, 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 unmarked 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 acts 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 publication of their debts by certain States of North America are as strong in argument, as pungent in satire, and as effective in style as anything which he wrote in less than 40 years. (Athenæum; Gentlemen's Magazine; Preface to the Rev. Sydney Smith's Works.)

SMOKE BALIS. [Lamb's Balis, P. C. S.]

SOCRATES. [After Socrates, P. C. S.]

SOCRATES OF Bologna, the ecclesiastical historian, was born at Constantinople towards the end of the fourth century. He was instructed in grammar and rhetoric by Ammonius and Helladius, of Alexandria, and afterwards followed the profession of scholastic or advocate, on which account he is generally designated as Socrates 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 compilers of the history of Eusebius [Eusebii, P. C.]; he is less florid in his style and more careful in his statements than Socrates of Crete [Socra, P. C.], and less judicious than Theodoret [Theodore, P. C.]. He is likewise the earliest writer of the three, and Socrates is supposed to have borrowed some what largely from him. His history extends from the year 300 to the year 392, and is called in his 'Historia Tripartita,' and was published for the first time as a continuation of Eusebius, by Robert Stephens, Paris, 1544, in fol. There is a good French translation of it by Bertrand and D'Arches, in four volumes, 1681, 12mo., and another in German, by J. C. Boisserée, Hamburg, 1781, 4to. The history is résumé in several handbooks; the five last are chiefly composed on the authority of Rufinus [Rufinus, P. C.], and on the relations be gathered from eye-witnesses of many of the events he records. The two last in the form of letters to their readers [Le Sear, P. C.], are somewhat dull, and the reader is permitted the middle-sirth; unfortunately for the truth of this

had omitted several of the principal circumstances in the life of this celebrated father of the Church. [ATHANASIUS, P. C.].

He therefore went to Rome to find out the established residence of St. Anianus and Livius, who, however, 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 (b. 1, c. 1), a mistake the more extraordinary as he states himself, in the 'Historia Tripartita,' to proceed upon the minutes of the Councils to relate the principal events which took place in that city. 'The carelessness of writers of that age, says Gibbon, 'leaves us in a singular perplexity.' 'Hist. of the Church of Rome, c. 169, note 2,' Theodoret, and others, have not only been taken also respecting the number of bishops who refused to sign the creed drawn up at the Council of Nice (b. 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 bishoprics (b. 1, c. 51), on the occasion of his marriage with Justin, 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, who has, however, despised the other Roman Catholic historians; but Vallesia in his life clearly shows that there is no reason for such suspicion. We may mention another principle which he has followed, in which the mind of Baronius may have tended to confirm the notion of his heterodoxy—that he is invariably adverse to every form of persecution on account of religious opinions—'qcarvcn à llywv àv év yapcflav peractayvoc, év v7iaxvovcris: and I call it persecution to offer any description of persecution to those who are quiet.' ('Hist. of the Church,' p. 104.) He is, however, very generally suspected of a leaning in favour of the schism 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. (NOVATIANI, P. C.). The date of his death is not ascertained.


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 20th of June in the Church of St. Bartholomew the Great, in that year in the parish of the same name.

Le Soeur must have been a man of about fifty years of age in 1630, for John of Bologna died in 1609 in Florence at an advanced age, and Le Soeur must have visited Florence therefore prior to the beginning of the century when he was his pupil. The connection with John of Bologna, who was a native of Donay in Flanders, and his subsequent connection with Rubens in England, seems to indicate Flanders as the country of Le Soeur rather than France. Rubens is said to have designed the much-admired bronze or brass statue of William Earl of Pembroke in the picture gallery of Oxford, which was executed and cast by Le Soeur. William Earl of Pembroke was Chancellor of the University of Oxford from 1616 to 1630.

In 1633 Le Soeur cast the well-known equestrian statue of Charles I. at Charing Cross; it was cast in a spot of ground near the temple and put up before the commencement of the great civil war, it was sold by the Parliament to a buyer of the name of John Rivers, living at the 'dial near Holborn Conduits,' who had orders to cut off the head of the statue thereon, which is fixed into several old books; the five last are chiefly composed on the authority of Rufinus [Rufinus, P. C.], and on the relations be gathered from eye-witnesses of many of the events he records. The two last in the form of letters to their readers [Le Sear, P. C.], are somewhat dull, and the reader is permitted the middle-sirth; unfortunately for the truth of this
story, however, the saddle-girth is there, and further, Le Soeur can never have seen the statue set up, as he must have died several years before 1678. The figure is dignified and expressive; it is a faithful portrait, and so admirably defined in modelling; the hinder quarters are especially void of character and motion. The pedestal was made by Grinling Gibbons. Walpole speaks of a bust at Stonorhead by Le Soeur, which is in the collection of Lord Cobbe; but it is very numerous; the poet himself is said to have been painted under a dragon h is Romaine, three feet high on a black pedestal. It is mentioned in Vanderdoert's Catalogue of Charles the First's Collection. Le Soeur executed many other bronze or bronze works in England, but they are now all lost or destroyed.

(Walpole, Anecdotes of Painting, &c.; English Con
considerations.)

SOLIDITY 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, represent the direct action of hard bodies. In such cases the effects of hardness. Balls of glass or ivory, or steel springs, serve to show the mechanical actions of elastic bodies. (Collins on Perfection of Bodies, P. C. S.)

SOLIDUS is the name given by the Romans to a gold coin, minted at 1000, 900, 800, 700, 600, 500, 400 P. C., and the equivalent of the English sovereign. (The English, their Manners and Customs, Etc.)

SOLIMENA was the rival and at the same time the friend of Luca Giordano, and in 1676 he was left without a rival, and he raised accordingly the price of his paintings, which however in no way diminished the number of his commissions. His works, both in oil and fresco, are very numerous: they are the frescoes of the sacristy of the Stallion of San Filippo Neri in the church of the Oratorio: there are also, likewise by him, some others at Naples have been several times published. He was never married; his large property, which besides estates amounted to 500,000 scudi, went to his nephews, the sons of his brother Tommaso Solimena, who was a distinguished lawyer. During his long life Solimena appears to have made only two short visits to Rome. Of his numerous scholars the principal were Sebastiano Conca, Giuseppe Corrado, Ferdinando Sanfelice, and Francesco di Mura.

(Donizetti, Vie de Pittori, &c. Negoliati; Lanzo, Storia Pittorica, &c.)

SOUTHBY, WILLIAM, was born in London, November 30, 1730. He was the fifth son of Sir William South
by, K. G., and was educated at Eton and at Christ Church, Oxford. In 1753 he joined the army, and purchased a commission in the Tenth Dragoons, from which he immediately obtained leave of absence, and passed several months at the military academy at Angers for the purpose of studying the principles of his profession. He was afterwards appointed one of the secretaries to the king, and immediately afterwards quittd the army and purchased Bevis Mount, near Southampton, where he continued to reside for the next ten years, amusing himself with poetic studies and writing. In 1766 he made a pecuniary tour to Italy, with Sotheby, of which he published a poetical narrative under the title of 'A Tour through North and South Wales.' His mother died in 1750, and in 1751 he removed from Bevis Mount to London, where he settled in the Strand, and was giving however a considerable part of every year at the Good House, in Epping Forest, of which he was one of the master keepers. Soon after he settled in London he became a Fellow of the Royal Society, of the Antiquarian Society, and of the Diluenti Society; and was in the habit of receiving at his house persons distinguished in literature and politics without any regard to party distinctions.

The language and literature of Germany had been for some time advancing in favour in England. Taylor, of Norwich, had chiefly contributed to this result; and Southey's friend Spenser had translated Bürger's 'Luscinia' with more success than Taylor had previously. Southey studied the language, and in 1796 published a translation of Wieland's 'Oberon,' which immediately became popular. In 1799 he published a short poem on the battle of the Nile, and in 1800 a translation of the 'Georgics of Virgil.' In 1801 he ad
ressed Sir George Beaumont in a 'Poetical Epistle on the Encouragement of the British School of Painting.' In 1808 he published 'Orestes,' a tragedy, in the model of the Greek drama, accompanied by a mask, entitled 'Huron de Bour
deaux,' founded on the story of 'Oberon.' His next work, on which he was occupied the greater part of two years, and which appeared in 1810, was a history of the 'United Kingdom of South.' In 1810 he produced 'Constance de Castile, 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. Sotheby tra
velled through France, Switzerland, and Italy in 1816, in company with Mr. Elmsley and Professor Playfair. He returned to England, and was appointed, in 1817, Professor of Greek in the University of Edinburgh. In 1817 he published a corrected edition of his translation of the 'Georgics,' together with the original text, and the translations of De Lille, Boer, Guzman, and Voss, in folio; of which the first and second editions, and several editions of Europe, and received medals from them in acknowledgment.

When he was in his seventy-eighth year he commenced a poetical translation of the 'Iliad,' of which he completed a portion only, before his death, which took place in Scotland with the summer and autumn of 1826. On his return to London he pursued his task with unabated diligence, and completed the 'Iliad' in September, 1830. He immediately commenced the 'Odyssey,' which was completed, without his life, in July, 1832. 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 1818, 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 Nagpoor, in Hindustan, was killed in repelling an attack of the Pindareres, November 27, 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 1808, a work for the use of the schools; and his versions of descriptions of Italian scenery, most of which were probably written while he was travelling in 1816-17, and a few other small compositions.

As to his minor poems, 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 of imagination, but he has great facility and elegance of diction and versification, and hence his poetical translations are among the best which have been made in English. His 'Oberon' is an excellent version of Wieland's romantic poem, tolerably close, and not inferior to the original for the original tongue. He could not read German. His version of the 'Georgics' seems to have been a favourite work, and to have occupied much time in correction and improvement, and is perhaps superior to any other which has been made in our language.

The folio edition was published at five guineas, and is a splendid specimen of typography. His versions of the 'Iliad' and 'Odyssey,' Cowper's blank-verse translation is the closest which has yet been made. Sotheby's is in rhyme. In 'Blackwood's Magazine,' April, May, July, and December, 1831, are four critical articles on Sotheby's 'Iliad,' written by Professor Wilson in his usual popular style, but with great skill, truth, and nicety of discrimination, in which the translation is examined and compared, as well as the translation of the first book of the 'Iliad' by Dryden, and that (also of the first book) which was made by Tickell in rivalry with Pope. Sotheby's now have a share of the criticism which the critics deal out to the different translators; but Wilson's own specimens of literal prose versions exhibit Homer more truly than any of the others, and are probably to must readers more interesting, and even more delightful to read.

(Annual Biography and Obituary for 1835.)

SOULAMIA (Soolumina is the name of the tree in the Moluccas), a genus of plants belonging to the natural order Polypales. It has 5 sepals, the 3 outer ones very small, the 2 inner large and concave. The petal is concave. The capsule spheric, indehiscent, compressed, corky, margined, and spotted. The seeds are large, black, hard, and flat. The fruit is composed, thin at the edges, dry, with 2 seeds in each cell resembling cucumber seeds, but smaller, each lying in a small cavity of the cell. The plant is introduced in gardens, and the mode of cultivating it is at present unknown.

(Don, Gardener's Dictionary; Lindley, Flora Medic.)

SOU, CURE OF. [BERRITF, P. C.]

SOULIA is a Bight, or bay, established on the southern shores of Australia. It extends, as fixed by the British government, from 132° to 141° E. long. From the coast, which at its western border occurs near 32° 30', and at its eastern near 38° S. lat., its boundary line runs due north to 34° 27' S. lat. and forms a considerable continent on the southern coast. On all sides three is encompassed by Eastern Australia, or New South Wales. Within its boundary are contained two large bays: Spencer's Gulf, and the Gulf of St. Vincent. The town of Port Napier is on the coast of the River Murray. Kangaroo Island, which lies before the entrance of the Gulf of St. Vincent, is also annexed to it. The area of the colony, according to a rough estimate, is about 3,000,000 square miles and, and it is about 100,000 square miles larger than France.

The western portion of the territoy is a mere waste. Near the western boundary-line the country along the sea- coast is covered with scrub. It is almost entirely destitute of grass, and also of water, except during the rains and a few days after they have ceased, when small quantities of water remain in the flat depressions for a short time. This country continues as far east as Streaky Bay, south of which there is some improvement. The shore is skirted by low sandhills; and at the back of them is a belt a few miles wide, whose surface presents a succession of low hills, wooded and grassy, but very stony and destitute of water, except what is left by the rains in the depressions between the sandy hummocks and the hills. This country, being the country of the plains, consists of a succession of level, flat, and low lands, without water, and with rich water, consists of a succession of level, flat, and low lands, without water, and with rich

On the southern shores of Australia, Streaky Bay and the head of Spencer's Gulf, lies a mountainous tract, exhibiting a succession of lofty ragged ranges, one behind the other, running from east to west, but terraced or north-west at their extremities. They are called Gawler's Range, and attain an elevation of about 2000 feet above the sea-level, but decrease as they advance further east. Those ranges are devoid of timber, and have a barren appearance, but are overgrown with prickly grass. There are no rivulets nor 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 cliffs of the rocks. The country north of Gawler's Ranges 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 harbor 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 mudsandy sand; it is much frequented by the vessels of the public service. Round these extensive sheets of water are many large tracts of well wooded, and others grassy with single trees dispersed over them. It is calculated, that in the vicinity of Port Lincoln, there are the greatest number of good places 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 a sandy red loam, greatly mixed with stones, and presents only here and there a little old without grass. There are no high trees, but patches of scrubby bushes, and a few small pines. No water has been discovered.

The waiting mentioned in the head of this article, Spencer's Gulf, with a rather narrow channel, separates it from Flinders' Range. This tract is quite level, and has a sandy soil almost without vegetation. Flinders' Range constitutes the western boundary of a mountainous tract of considerable extent. It occupies in width a considerable space from west to east, lying east of Spencer's Gulf. It may be said that this mountain tract terminates on the south of the heads of the channels of the Murray and the River Murray, but is turned into a higher summit at the mouth of the Murray, where, a higher summit occurs, Mount Bryan, 3000 feet high. From these parts it extends nearly due north, with a small declination to
In its natural state it resembles a park, the single trees standing at considerable distances from each other. In this part of the city, the town of Adelaide is situated. It is built 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, when the hills are full, and the flat, the plain upon which the town lies, appears to be Mount Brown, not far from the head of Spencer's Gulf. Further north, the mountains decrease in elevation. Between these ridges there are plains of considerable extent, and the plains are covered with almost naked rock, generally sandstone, and without the least vegetation. The lower slopes are covered with dense brush, and the valleys with low shrubs, and occasional small patches of vegetation. The plains are watered by a brook, a stream, or a narrow-arm, which is sometimes dry. They are sandy, and are capable of cultivation. In a few places, patches of grass are found, but others are quite sterile. During the rains, and a short time afterwards, running water is found at a few places among the hills, but it does not appear that it reaches the plain at the foot of the hills.

This mountain-region, as already observed, terminates on the north near 39° 15' S. lat., its extremity is surrounded by a narrow and abrupt coast. This coast is composed of a thick deposit of sand with water and sandstone with islands. The first explorers of this region considered it to be a lake, and called it Lake Torrens. But it was found that these appearances were deceptive, and that the coast was a narrow or very narrow river. Not a drop of water was found, and the islands turned out to be mere low sandy shores, scantily clothed with wasted scrub on their summits. A salt crust is found at intervals on the sand, and a few pieces of salt appear to be drift timber are lying about. Not a blade of grass or any species of vegetation is visible, and the sand is loose and drifting. This desert is about 800 feet above the level of the sea.

The river Broughton may be considered the southern boundary of the barren mountain-region just described. This river rises on the declivities of Mount Bryan, and appears to be a considerable river during the rains. In the dry season its upper course consists of extensive reaches of water connected by a strongly running stream, into which several chains of ponds discharge their water during the rains. Lower down, the Broughton winds through some broken hills of an open but barren description, and here the water is lost in the sands; only water-holes are found at intervals. Still further down, the channel, though very wide and deep, is quite dry. After this, the river turns south, and is lost in the Gulf of St. Vincent.

South of the Broughton a few high hills are found, as the Razorback (2000 feet above the sea), and the Lagoon Hill (2000 feet), they soon sink much lower. The country becomes more hilly, and smaller, and is excellent for the grazing of sheep and cattle. Here the river is lost in the sandy deserts. The southern end of the Broughton have open, and are covered with grass, but the rest of the peninsula is better adapted to pasture.

The country of the colony is the country lying on the east of the Gulf of St. Vincent. The interior of this tract is hilly, but the hills do not attain a great elevation; the highest, called Mount Lofty, is about 1200 feet above the sea-level. This is the highest point on the eastern edge of the colony. The hills come down to the sea on the Gulf of St. Vincent, about three miles south of Holdfast Bay, and occupy the whole of the peninsula between the Gulf and the sea. This peninsula is generally watered with large timber trees, and between them are tracts of good land. Along the shores of the Gulf are low sand-hills, on which bushes grow. Between these down and the hills, there is a considerable patch of country which contains a great portion of land capable of cultivation.

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 of carbonate of lime, with occasional low wooded valleys which only shalvery bushes grows. At the sea-mouth of the Murray begins a narrow arm of the sea, which extends along the shore and parallel to them over an extent of more than a hundred miles. It is called Coorong, and extends from the open sea by a narrow strip of land covered with sand-bills.
downs of moderate elevation. At the back of the northern half of the Coorong there is a belt of grassy hills overgrown with succulent plants, and between them there are numerous shallow plains of moderate extent with a good soil; fresh water is found at a moderate depth under ground, rarely exceeding six feet. There is a belt of the rain forest on the north side of the desert, at the back of the southern half of the Coorong there is a succession of salt swamps and low shrubby hills. A low range, called the Wanblat Range, runs for twenty miles parallel to the coast-line of about thirty miles. Behind this range 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; the swamp small sandhills, well wooded and grassed.

The Coorong terminates near 35° 30' S. lat., but in the line of its continuation 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° 30' S. lat.) the country improves. It consists of several ranges of wooded hills, generally running parallel to the shore, 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 pasture or agriculture.

The southern 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 in the north. Near the mouth of the river shore low narrow ranges of wooded hills alternate with grassy plains and a few swamps. In approaching the higher country plains occur, which are of considerable extent, and covered with luxuriant forests, 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 line rises to about 1000 feet above the sea. Between this range and the isolated mountains called Mount Gambier and Mount Schank lies a well-wooded 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 800 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 1200 square miles. It rises from the sea to between 100 and 200 feet, 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 soon as the coast is passed, the whole 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 crystallised 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 Neptune 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 a part of the country, which is towards the south, is 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 cover 16,000 square miles, a very considerable tract of land, and one which is probably available land.

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 conjecture what can be learnt from some agricultural observations. The dry season begins at the end of August and continues to the end of March. In December and January, corresponding to our June and July, the country appears to be in its greatest depression, and the least breaks raise clouds of dust. During the wet season, from the epih of March to August, it rains frequently and sometimes very heavily. The long droughts, with which New South Wales has been so much visited, are not known in South Australia. It appears that the rain diminishes greatly the moment it has proceeded inland, and it is probable that it ceases entirely before it reaches the northern boundary-line of the colony. During the winter it rains but slightly, and the country is then green, and frequently in hard gales. In the dry season northern and north-eastern winds prevail. Frost has never been experienced, nor any fall of snow.

During the very 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 and wallaby, a small species of the large genus, the opossum, and the dingo, or Australian dog. Birds are numerous, and distinguished by their beauty. The emu, several kinds of parakeets, of cockatoos, partridges, and quails are common.

The most common sea-fowl are pelicans, black swans, wild ducks, divers, waders, coromans, and Cape-pigeons (Procellaria Capensis). Several kinds of fish are taken in the sea, as salmon, mappers, porpoises, 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 small ponies from the Indian Archipelago; cattle and sheep from the Cape, Tasmania, and New South Wales; hogs from New Zealand. Poults are common, both the common species and the larger one from South America; the former is valued for its flesh, the latter for its breed 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; potatoes, water-melons, pumpkins, and cucumbers attain an uncommon size, and also cauliflower. 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 the interior. Copper-ores have also been discovered in places in the vicinity of the settlements; and a quantity has already been shipped for England. It is stated that this ore is about 15 per cent. of copper; it is found in large masses. 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 civilisation 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 some of those kinds of occupation which are at present done by the natives. 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 South Australia, and the whites having settled in the territories 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 tribes inhabiting the vicinity of Port Lincoln; a third by the Aborigines on the coast about the banks of the Murray River. A native of King George's Sound, in West Australia, who accompanied Mr. Eyre in his expeditions, did not understand the language spoken by the other tribes, and that of the whites was so different as to enable him to distinguish the three; and this was before any white had set foot on the shores of South Australia. The settlement of Adelaide was founded in 1836; but six or nine months previously some families had settled on
Nepoc Bay, on Kangaroo Island, at a place called Kingscote. At first the emigration to this colony was very great, and in 1844 the number of white population was estimated at 15,000. In 1838 the colonies of Port Phillip and New Zealand were founded; which offered greater advantages to the settler; and the current of emigration ran to those countries and some very few have gone to South Australia. The white population at present probably does not exceed 20,000 individuals. The greater number of them are settled in the fertile country in the vicinity of the town of Adelaide. The traffic to and from South Australia is carried by the steamer Furneaux, which runs to and from Melbourne, about once a month.

SECOND 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), secondly he was a man of great weight in the House of Commons, and the object 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 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 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 northermost part of America; and into, and from all countries, islands, and places, within the dominion of the crown of Spain, or which shall hereafter be found out or discovered within the said limits, not exceeding 300 leagues from the continent of America, between the southermost part of America, and the king of Portugal, and the crown of Surinam in the possession of the State-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 under the name of the Earl of Oxford's masterpiece. 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 carried on was from the first extremely insignificant. By the peace of Utrecht says Coxe (Memoirs of the Robert Walpole, i. 127), Spain and the Indies were confirmed to Philip V., that monarch was too jealous to admit the English to a free trade in the South Seas; and, instead of the Company's original success, the Company obtained only the Assiento contract (P. C. ii. 508), or the privilege of supplying the Spanish colonies of America with cargoes for thirty years, with the permission of sending to South America, for the amount 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. But this disappointment was attempted to be counteracted by the depression in the South Sea Company 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 a pompous nomination of the South Sea Company had paved the way to tremendous settle factories. But the grand benefits of this commerce were never realized. The first voyage of the annual ship was not made till 1717, and in the following year the trade was suppressed by Act of Parliament, with South Sea settle factories, and servants were seized and detained, notwithstanding the agreement in the Assiento 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 end of the year 1719 or beginning of 1720, the ministry of Sunderland and Stanhope seems to have 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 32nd 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 a sole national company. The members of the House of Commons 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 expressed his desire in the Commons that he, and other persons, should be invited to become shareholders, 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 to the House of Commons offering to pay 7,600,000l. for 3,300,000l. shares in a second proposal on the same day, which was supported by Walpole; but on the representations of Ataliba, the chancellor of the exchequer, it was resolved that the proposal of the South Sea Company should be accepted. Having regard to the 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. i. 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 promoters, Coxe, reported to the directors of the Company, that the 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. i. c. 4.

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of that of its rivals, procured writes of scarce fiction 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 first plan had been specially hurried to take their 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 other companies, legally incorporated, submitted, 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 period the sun, when thrown into the atmosphere, and under the impression South Sea stock itself soon began to tumble down. By the 52nd of August it had fallen to 800; by the 30th it was at 750; by the 8th of September at 660; by the 20th at 410; by the 29th at 175. The bubble had burst.

It would require a great deal of space to tell the rest of the story of this remarkable financial infatuation 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. Two directors were all indicted of the greater part of their fortunes; Addis, the chancellor of the exchanger, was expelled from the House of Commons; Craggs, 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 carried round the streets of London in a disease almost as dangerous as that to which this land was with difficulty saved by the influence of Walpole; Stanhope, who was not supposed to be implicated in the fraud and bribery, burnt a blood-vessel while speaking upon the subject of Lords, and died of 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 buying; and during the most disgraceful moment, all or the greater part of which they had obtained without purchase.

The storm thus raised was weathered and surged, 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 exchanger 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 amnesties, till, all their claims having been satisfied, the company was finally dissolved only a few years ago.

It is not 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, at present, an unimportant question.

(Pouthway's Historical State of the South Sea Company; Anderson's Chronological Deduction of Commerce; Macpherson's Annals of Commerce; Craik's History of British Commerce; Carey's Memoirs of Walpole; Malcolm's History of London; Parliamentary History; Statutes at Large, &c.)

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 Wino-street, Bristol, where he was born, as the date is given by the 12th of August, 1774. Without according to the inscription on his tombstone, the 4th of October in that year. His first teachers were, a Baptist clergyman named Foon, said to have been a man of no ordinary ability, to whom he was sentwhen in the next, a Mr. Flower, at Corston, near Newton St. Loe; then a Mr. William Williams, a Welshman (something dropped into his mind by whomsoever, possibly, may have long after suggested the subject of his study). 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 in other accounts however is called a Rev. Dr. Meredith, who, it may be supposed, was his patron. At Westminster, where however he had incurred censure for taking part in a rebellion against the head master, Dr. Vincent, 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 prevailed at this time. Being of promise, he was adopted both in France and in this country; in the former, on account of his extreme of free-thinking on both subjects; and in 1794 he left Oxford. He and a fellow-townswoman, a young Quakeress, were the first in this country to be used as models for the volume of poems, under the names of Bon and Moschus. It was soon after this too that Southey became acquainted with Coleridge. Lovell had married a Miss Fricker, of Bristol; and, in 1795, started on a visit through the Alps, by which day united themselves to her two sisters. The three had formed a plan to go out together to the wilds of North America, and there to set up what they called a Fanciscan, in which they were to live without either kings or priests, or any of the other evils of old world society, and to renew the patriarchal or the golden age. But this fancy was never attempted to be carried into effect. Southey soon after set out for Portugal with his uncle, the Rev. Mr. Hill (or Herbert), who had been appointed chaplain to the English factory at Lisbon. He returned to Bristol in the summer of 1797; in 1798 he removed to London, and entered himself a student of Gray's Inn; but he never obtained the usual, the law, and all that is further related of him for some years, is that he was again in the Peninsula in the years 1800 and 1801, and that on his return home in the latter year he went over to Ireland. In 1804 he was appointed Chancellor of the Irish Exchequer (other accounts say to Mr. Foster, that is, we suppose, the Right Hon. John Foster, who however did not become Chancellor of the Exchequer till 1804), but was not taken into the grave. In 1807 he was appointed Chancellor of the Irish Exchequer (other accounts say to Mr. Foster, that is, we suppose, the Right Hon. John Foster, who however did not become Chancellor of the Exchequer till 1804). This appointment agrees very well with the inscription on the monumental tablet commemorative of Southey in the church of Crathwaite, which indicates that he had resided nearly forty years at Greta Hall in that parish. Wordsworth had, we believe, taken up his residence in this lake country before Southey; and they were soon after joined by Coleridge, who however left them in 1810, leaving Mrs. Coleridge with Southey, whose hospitable roof also sheltered his wife's other sister, Mrs. Lovell, now a widow. Long before this Southey had abandoned his democratic and half-didactical style, and taken up with one diametrically opposite. For all the rest of his life, as it is well known, he was an ardent, uncompromising, and somewhat intolerant monarchist and churchman, promulgating and maintaining doctrines, which were in some respects even something beyond conservative.

In November 1813, on the death of Mr. Pye, Southey was appointed Poet Laureate; and in 1821 he received the degree of LL.D. at the University of Oxford. In 1824, the year of his death, he was presented with a tombstone, which was placed in Westminster Abbey, and with a large gift of money, besides a valuable library, which was afterwards disposed of by auction in London.

Southey was the father of five, and the grandfather of three, with property amounting to about 12,000l., in money, besides a valuable library, which was afterwards disposed of by auction in London.

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In 1796, Joan of Arc, an Epic Poem, 4to.

In 1797, Poems, 8vo.—Letters written during a short residence in Brussels, 4to, 2 vols.

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 Ordóñez de Montalvo of that romance which had been originally written in Portuguese by Vasco de Lobreira), 4 vols. 12mo.—The works of Thomas Chatterton (In conjunction with Mr. Amos Cottle, the Life, originally printed in the second edition of the 'Bibliotheca Britannica,' 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, 4to.

In 1810, The History of Kehama, a poem, 4to.—The History of Brazil, vol. i. 4to.

In 1812, Omniana, 2 vols. 8vo.

In 1813, Life of Nelson, 2 vols. 8vo.

In 1814, For the commencement of the year 1814, 4to.—Odes to the Prince Regent, the Emperor of Russia, and the King of Prussia, 4to.—Roderick, the Last of the Goths (a poem), 4to.

In 1815, The Tempest; Carmen Nupiale (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 1778, 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 an Introduction and Notes, 2 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 Orose and the Crimes of Agurillo (partially printed in 1812, in the Second Part of the Edinburgh Annual Register, for 1810), 12mo.

In 1822, Letter to the Editor of the Courier Newspaper, dated Keswick, January 5th, and published in the Courier of January 11th of the same year, and now appended by Lord Byron to his tragedy of the 'Two Foscari'), 8vo.—History 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 Edinburgh Annual Register, 1810, 4to.)

In 1824, The Book of the Church, 2 vols. 8vo.

In 1825, A Tale of Paraguay (a poem), 12mo.

In 1826, Vindiciae Ecclesiastica Anglicanae, &c., 8vo.

In 1827, History of the Peninsular War, 2 vols. 8vo.

In 1829, Sir Thomas More; or, Colloques on the Progress and Prospects of Society, &c., 2 vols. 8vo.—All for Love, or The Sinner well Saved; and The Pilgrim to Compottella, 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, 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 (in Wordsworth's 'Sacred Classics'), 12mo.—The Doctor (anonymously, 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 Translator, 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, public morals, and general 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 'Encyclopaedia Britannica,' 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 the digestions 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 Robberda's 'Memoirs of the Life and Writings of William Taylor, of Norwich,' 2 vols. 8vo., 1843.

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 excelled more or less of a men of his day which was wanting in him. The light with which he was original and self-taught in them, seemed, even when it alone the strongest, to be only reflected light in him. In mere fertility he was equal to any of them. But his mind, although a teeming, was not an inventive or creative one. He returned a depot in it, but communicated to it comparatively little of any new nature or quality. His imagination might even be said to be both ample and gorgeous; still there was wanting the true spirit of the mystic, 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 grand, and majestic; but it cannot be called poetry, or 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 all advantages. It is essentially a prose style, and one unsuited to poetry, at least to poetry of any high order, by some of the very things that contribute to his character excellence. Its facility and suavity, running into some degree of diffuseness; its limp perspicuity; its equality and smoothness; even its very unities, are unfitted for the true poet. In the latter case, the poet of the Peninsular War, the Bivar, and the Regent, the Life of Nelson (in 1813). Both in its merits and in its defects Southey's style may be compared to glass, which perfectly transmits the light, but refuses to conduct the lightning. It does not rise to any splendour of eloquence; 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 case and kilomistic vigour, and is equally pliable to the expression of sprightliness and playful as of severe and indignant 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 professedly dated as the intellectual, often 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 his contemporaries, a man of the sincerest, gentlest, high-minded nature, and in all the relations of private life a man worthy of the highest estimation. (Memoir in Gent. Mag. for June, 1843; Dictionary of Literary Biography; Literary Gazette; Athenaeum; and the works mentioned in the article.)

SOWENS. [AYERS, P. C. S.]

SPACE, THEORIES OF EXPANDING, [TELEPUS, P. C. P., 163.]
SPALDING, SAMUEL, was born in London, on the 30th of May, 1807. He furnishes an example of success attended by no extraneous effort, or claim to notice, in the presence of any remarkable ability or aptness for its attainment. According to the testimony of his friends, it was only by means of great labour that he could perform his daily tasks with ease or rapidity in his steady and constant diligence. It was much even 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 mode in which he always entertained this view, perhaps, appears to have done much towards forming those habits of unceasing application which constituted one of the strongest features of his intellectual character. At a suitable age he went to a public school; but his parents, being too deeply interested in the study of theology to allow him to enter the train of spending his life in a secular profession. He now examined the evidences of Christianity with the most assiduous care, 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 expensive 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 Congregational Dissenters. He consequently applied himself with great ardour, theory and practice, to a study which he had to conduct, and to which he was destined, with a naturally feeble constitution, in which there is little doubt that the seeds of organic disease early existed. The object was the intellectual character, and one of his new relations, 'was benevolence.' In him it extended from the tree, 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 at University College, London, where he made himself an exact Greek scholar. During his academic 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 examinations for the degree of Bachelor of Arts, at 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 Physiologist, and in the Hebrew and Greek objects of the Holy Scriptures. He is there recorded as having 'passed a distinguished examination' in Logic, the Philosophy of the Mind, and Moral Philosophy. In consequence of this success he was urged by the examiners to undertake the study of his subjects; and this 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 1842, he purposed superintending the publication of his Treatise, but was prevented by the progress of his disease; and as a last resource he tried a sea-voyage, and went to Cape of Good Hope, where he died on the 14th of January, 1845, about three weeks after his arrival. His work was published during the same year, by his friends, and entered by the late Mr. Spalding, to the 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:-

(i) The primary notions of virtue and vice are derived from those feelings of like or dislike, which we experience in the view of conduct of others. These notions accrue new force and become more distinct in consequence of the sympathy which we experience in the review of our own conduct. The objects of moral obligation are a general virtue itself; and, secondly, the mode in which virtue ought to be displayed in the outward conduct. The great rule of action, which furnishes the ground of the virtue and vice, as inferred from the end and object of the various affections themselves. 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; from which is derived the sympathy of our nature. All other virtues are necessarily contained in this principle of benevolence; apart from which every sympathy itself is merely pathological, not moral. The moral character of man is not essentially, but radically, moral. Spalding's theory may be characterized by its referring conscience ultimately to emotion, not to moral judgment; by its ascertaining the necessity of there being other moral agents in the universe, not to its being derivable from any one; and by 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 may well regret that it is not more likely, and that it abounds with passages of genuine power and beauty; and that it is characterized throughout by an elevation of thought and sentiment which distinguish 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 is wholly free from all sectarian and party feeling, and exhibits a social sentiment which was a distinguishing characteristic of the author's mind.

SPARTINA, a genus of grasses belonging to the tribe Chlorideae. It has upright 1-flowered spikes in races, the glumes usually acute, often long, and at the upper end of the spike unequal, the outer boat-shaped, compressed, red; the styles elongated, nerved, half-way up; the stigmas bifid, protruding at the summit. It is of British species, the S. anglica, S. alterniflora. The former grows on muddy salt-marshes, the latter has been found only on the mud-flats of the river Itchen at Southampton.

(Spalding, Manual of British Botany.)

MUDBEAT (from edwby, a spate, 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-formed, 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. Rhoeas has wavy linear-lanceolate leaves, roundish downy leaflets, terminal erect racemes, and a much-berayed slender corolla. The shoots are covered with a whitish down. The racemes the length of the leaves. The flowers white and purple, more purple in the lower half.

S. officinalis has downy linear-lanceolate leaves, roundish downy leaflets, terminal erect racemes, and a much-berayed slender corolla. The shoots are covered with a whitish down. The racemes the length of the leaves. The flowers white and purple, more purple in the lower half.

S. Rosbrugghii has its leaves three in a wheel or scattered impari-pinnate. The leaflets from 4 to 5, in pairs, serrated and smooth, and a very small heart-shaped tooth at the base. The corolla is boat-shaped, 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 sessile spots. The flowers large, rose-colored, and delightfully fragrant. The limb of the corolla nearly equal, and elegantly waved at the edges. This species is remarkable on account of its serrated leaves. The wood is employed for many purposes by the natives.

S. longiflora is an arboreous plant, and has large spreading terminal panicles, a bilabiate corolla, long-pendulous sub-cylindrical follicles, which are joined in pairs and variously curved. The flowers are large, yellow, and very fragrant. The follicles are very long. The wood of this tree is high-coloured, hard, durable, and of much use amongst the inhabitants of the hills about the coast of Coromandel and Malabar, where it is plentiful.

The species are splendid plants when in blossom. A mixture of loin and post suits them both, and cuttings will strike readily in any potting compost. They are elegant and decorative and as much as the magnolia. The peduncle of Mississippi is the type.

(Don, Gardener's Dictionary.)

SPATULARIA, a genus of fishes of the Sturgeon tribe, remarkable for the peculiar shape of their mouths, which are enormously prolonged and jaw-like in form. This peculiar structure is peculiarly the type.
SPEAKER. [Parliament, P. C.]

SPECIAL OCCUPANCY. (Occupancy, P. C.)

SPECIALTY, SPECIALITY DEBT, or debt by special contract, is a debt which becomes due or is acknowledged to be due by an instrument under seal. [Deed, p. 730.]

The cause of such a debt by simple contract is explained under SIMPLE CONTRACT.

Blackstone (iii. 464) considers a debt of record, that is, a debt which appears to be due by the judgment of a court of record, as 'a cause not being taken to deduce by the sentence of a court of judicature.' This is, however, an erroneous view of the matter. It is simply a rule of law that a debt for which the judgment of a court of record has been obtained is not payable over other courts.

SPECIFIC HEAT is the quantity of caloric which a substance of any kind absorbs, or which it gives out, when it undergoes a change of temperature; being determined, in a substance of any kind, with relation to the quantity which is lost in undergoing a like change of temperature. This designation, which is said to have been first used by the Swedish philosopher Wilcke, has nearly replaced the less proper one of Capacity of Heat which was given by Black, who first remarked that in order to bring different substances to equal temperatures of different quantities of heat must be applied.

Dr. Black considers that heat exists in all substances in two different states: one state he supposed to be that in which the heat is so united to the substance that it is in sensible or insensible, and the other to be that in which the heat is sensible, or is capable of being made evident to the senses, and of being measured by the thermometer; the former is that which is now designated specific heat. The term capacity for heat is considered objectionable, because it seems to imply that the heat existing in any substance is contained in the pores of the substance; and, if it were so, it should follow that the capacities of substances for heat are directly proportional to the porosities of the substances or inversely proportional to their densities, which is far from being the fact, though it is well known that the more dense substances contain smaller quantities of heat than those which are less so.

In determining the relative specific heats of two substances, either the substances when heated to a certain temperature are plunged in cold water and the augmentations which they occasion in the temperature of the water are observed, or the instrument called a Calorimeter [H. G. P., p. 92] is employed.

With this instrument, since the ice surrounding the heated substances which are separately introduced in it continues at a temperature expressed by 32° Fahr., till it is entirely melted, it is evident that the quantities of water (at 32°) arising from the dissolution of part of the ice by the different substances, whose temperatures had been previously raised to equal heights, must be proportional to the caloric lost by the ice in raising its temperature from 32° to its melting point, and thus the specific heats of the substances are determined. When, as is usual, heated water is the substance introduced in the calorimeter, the ratio between the specific heat of water and that of the substance is used.

If the body whose specific heat is to be determined is a solid, it is first heated to any convenient number of degrees of temperature, suppose 212° Fahr.; it is then placed in the calorimeter, and allowed to remain there till it is reduced to the temperature of ice (32°): then the quotient arising from the weight of the water obtained from the melting of the ice surrounding the body, divided by the product of 180° (=212° — 32°) multiplied by the weight of the body, will express the required specific heat.

The specific heat of water or any other liquid is determined by the calorimeter in a similar manner; the liquid heated to 212°, for example, being contained in a vessel of known specific gravity, and examined to ascertain the total quantity of water produced by the melted ice that part of it which, by experiment, is found to depend on the cooling of the vessel containing the liquid.

The specific heats of different solids, that of water at 212° being unity, were found by Hutton, using the following calorimeter:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Specific Heat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platinum</td>
<td>0.00355</td>
</tr>
<tr>
<td>Silver</td>
<td>0.0087</td>
</tr>
<tr>
<td>Copper</td>
<td>0.00949</td>
</tr>
<tr>
<td>Iron</td>
<td>0.0198</td>
</tr>
</tbody>
</table>

The difference between the specific heats at different temperatures is ascribed to the dilations 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 substance in a liquid state. This is, therefore, a liquid solvent among the solids.

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>0.092</td>
</tr>
<tr>
<td>Sulphuric acid (spec. grav. = 1.87058)</td>
<td>0.334596</td>
</tr>
<tr>
<td>A mixture of sulphuric acid and water in the state of 32°</td>
<td>0.609162</td>
</tr>
<tr>
<td>Nitric acid (spec. grav. = 1.29898)</td>
<td>0.661931</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 chemists. During the struggle of Hamburg, in the winter of 1813-14, his parents took refuge with their family in the house of the banker Dehn, in Altona, where there was a good collection of pictures, and where Erwin made the acquaintance of the painter J. W. von Stroud, 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 1820 his father, the banker, at the instance of the Herrich 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 Heinrich Fuchs who died in the Father's house.

In 1828 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 monuments of art in and about the neighbourhood. This led to an artistic tour which he performed in 1828, with a brother and another artist friend, through Schleswig and the neighbouring country. The chief objects of this journey were the cast altarpiece of Hans Brügman at Schleswig (lithographed by Böndel) and the picture of Maeling at Liibeck, the latter of which Speckter and his brother Otto published in lithography. These early works gave Speckter the peculiar bias which at that time characterised 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 Liibeck, confirmed this tendency, and for a time enlisted Speckter among the young enthusiasts who appear to be devoted to the restoration of the sentimental symmetrical art of the Renaissance in Germany, with the addition of academic drawing. Overbeck's picture has been lithographed by Speckter, and 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 town-house of Möllin. His adoration of Overbeck's pictures has been to have himself 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 vaults or loggia in the Munich church, where he was painted. A 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 already possessed of a sufficient score of commissaires, was naturally exultation, but he did not live to execute it, for the Pinacoteca was not ready for the frescoes 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 picture had a very prejudicial effect upon him, through his inordinate admiration for his pictures, and his inordinate desire for being the greatest painter of his day. He went to Italy while the work was being completed, and had hitherto possessed him, though it was gradually yielding to his own experience, was finally subjected by the contemplation of the great Italian works in the Museums of Berlin and Paris, and especially those of Filippo Lippi, Raphael, and the greatest 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 letters sent from Italy, which have been published by Dr. Rummohr, frequently reprints of them. In Rome, Speckter and Naples, until the summer of 1834, when he was called to Hamburg to paint in front of the villa of Dr. A. de Chatouven, near the Villa de Popoli. In Rome Speckter confided his labours almost exclusively to studies, and these are in the general spirit of Italian art, and quite a different style from his early efforts. The only oil-paintings he painted in Rome were two of Albanian women, in ideal characters, and a large picture of Samaon and Dalillah, which was purchased by Rummohr.

In the spring of 1836, though suffering greatly from asthma, Speckter commenced his frescoes; he had in the interval completed three of the principal cartoons: the objects are from Greek mythology, and the figures are half the size of life. These objects were—1. The winged Pegasus from the Muses, and the Hippocrene fountain, which springs from the horse (M. de Chatouven describes the nymphs or goddesses of this place as the Genius guardian of the place). 2. Two Greek columns; 3. The Graces, in a grove of laurels, decorate the bow and quiver of Cupid, and offer him a cup of ambrosial drink; and 5. The Fates, lulled by the lyre of Cupid, have ceased their labours, and recline on cushions; 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 30th of that month in 1832, deeply lamented by his friends, and by none more than Rummohr, who wrote a short account of the character, which is incorporated in the 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 Künstlers aus Italien'), Leipzig, 1846, are all of historic matter and reflections on art. Speckter's whole career is a remarkable instance of the power of nature over convention, where the love of art was real. The essential attractions of art lie in the harmonies from conventional and systematic, in which art was only secondary to a peculiar sentiment independent of it, to the art itself, and for its own sake. Speckter's transition from convention to nature is not singular in the history of German art. (Briefs, 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 (Diazoros, P. C.; and, for the dark lines observed, Babinet and V. 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 that if the one prism is in the direct rays, the other in the reflected, the rays will not be wholly converted, 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 is formed by a prism of flint-glass, the mean ray, instead of being at that boundary, will be much nearer the red or least refracted end of the spectrum; consequently, with flint-glass, the rays which suffer the least refraction occupy a greater length in the spectrum formed with a prism of crown-glass, so that the least refrangible rays occupy a greater, and the most refrangible rays a less extent than they respectively occupy in the spectrum formed by the latter prism. The pencil of white light be made to pass through two prisms, one of crown and the other of flint-glass, their refracting angles being such that the red and violet rays of the spectrum are unaltered, there will be formed on the screen a double or secondary spectrum, its upper part, or that which is near the violet end, consisting of the green light which remains unaltered, and the lower part consisting of the light formed by the unaltered red and violet rays, the image of the upper part 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 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 viewed, the upper part will appear to be fringed with green and the upper with purple.

This dispersion of light, which remains after the rays have been refracted through an object-glass composed of two lenses, of which a greater than an equal thickness is formed by a combination of their angles, is due to the incompleteness of the achromatic telescopes: the fact of the dispersion will be evident in any such telescope if the eye-pieces be drawn out beyond the point at which a luminous object as the moon appears distinct, or be placed nearer the object-glass than that point; for, in the former case, the object will appear to be surrounded by a bright margin of green light, and, in the other, it will be surrounded by a fringe of purple light. (Breuer, Treatise on New Philosophical Instruments, p. 306.)

Prisms of three different media might be formed which would unite the rays of three different colours; but the incorrect disposition of the light and the biographies of the colours formed, which is incorrect for the biographies of the colours formed, which is incorrect for that which remains when two differently coloured rays are united, and Sir John Herschel, in the 'Encyclopaedia Metropolitana' (art. Light, No. 446), proposes to call it a tertiary spectrum. The greater skill of higher orders might be found by using a greater number of prisms, for the purpose of uniting with the former the rays of other colours; but the diminution of light caused by the employment of so many media would become an evil greater than that which is proposed to correct. Sir David Brewster has given the name of tertiary spectra to the images formed by the incorrect colours which remain when two differently coloured and violet rays are united by casting a pen 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 a little the brighter in the fall of the sun. This produced such obliquity to the surface as to render the dispersion of the red and violet rays in that prism sufficient to allow it to be exactly corrected by the contrary dispersion produced by the other. Again, a planchet proposes to call spectra so produced subordinate spectra.

The celebrated Fraunhofer first observed that when a beam of light from the sun, after passing through a narrow slit (less than a line in breadth) in the window 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), was also observed, there resulted a number of colored 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, this screen produced a series of colored spaces 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 colored 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 ofcoloured spaces similar to those in the spectra of the first class, but without the dark lines; and these linear apertures 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 last. Fraunhofer lighted upon the third class of spectra, composed of colored spaces, of homogeneous light, and separated from one another by dark lines; these he called spectra of the second class.

Several 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 parallel to one another; the frames being placed so that the wires in one were at right angles to those in the other.

SPECLARIA (so called from Speculum Veneris, Venus's mirror) is a genus of plants belonging to the natural order Campanulaceae. It has a rote corolla, a linear-oblong prismatic capsule opening by lateral pores between the calyce segments. In other members of the genus the corolla is always shorter than the ovary. This plant is a native of the corn-fields of Great Britain, and is found commonly throughout the region 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 expected 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.)

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. He was the eldest son of George John, second Earl Spencer, and Lavina, eldest daughter of Charles Bligh, first Earl of Lucan, and was born on the 30th of May, 1750. Like his father, he was fond of music, for his love of literature and his munificent expenditure in the collecting of rare books, he was educated at Eton; whence he was sent to Trinity College, Cambridge, where he took the honors of A. B. in 1771.

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 Cloudesley, and took the honours of M. A. in 1771.

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 the Home Department, 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 331, for Lord Althorp 125, 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 Northumberland, and held his seat six years. It was, for his lordship, 2095; for the other member, William Ralph Cartwright, Esq., 1990; for Sir William Langham, Bart. (the defeated candidate), 1381. After this his lordship continued to be returned for Northumberland for the next session, and was again returned. He was an ardent supporter of the opposition: he was, in 1820, placed on the ill-fated down to the passing of the Reform Bill. In the first Reformed Parliament, which met in January, 1828, he sat as one of the members for the southern division of that county.

Lord Althorp, of course, lost his seat at the Reform Act, and 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 he declared that there was no man on either side of the House who the public generally held in greater respect for his universally admitted patriotism and freedom from the narrowness and rancour of faction. Yet he was no temporizer or 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 as he could with them as any man. In 1817, for instance, we find him 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 many permanent officers by the state, the abolition of the Alien Act, and the additional grant to the Royal Debt; 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 measure; in 1824 moving for a Committee of Inquiry into the general state of Ireland; in 1825 opposing the Suppression of the Catholic Association; in 1826 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 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 a strong confirmation from some of his countrymen; 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, and whose plans had been thwarted, and he 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 able men, and the Whig party in particular has 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 the support of the great measures of the day so much popular confidence and support, and would have carried them through parliament with unexampled ease and an earnest equality to Lord Althorp. To the honour of the House of Commons, character in public men has an authority there which stands its possessor in lieu of more striking qualities; and no distinguished 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 stood without equal in the country. It is a fact which he had no object but the prosperity and prosperity of his country.

In respect to the great questions which have risen into political discussion and excited so vital an 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 with the principles of the noble and candid gentleman, and there is no 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 the House of Lords in August, 1837, when the Whig budget and the stability of Lord Melborne's government were at issue, he moved the address on that occasion, and emphatically declared himself in favour of free trade. There was an occasion also, when a sudden shock 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 made greater progress amongst the middle or the upper classes of society than when he could appeal to the revised sentiments of so devoted and so distinguished a farmer as Lord Spencer.

But to return to the narrative: In November, 1837, the Whig section of the Goderich 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 qualitative pledge that Althorp would be respectively appointed, after a communication had been made to Lord Althorp, and his lordship had signified his conditional acceptance of the introduction of the bill by the opposition. Mr. Herries, the 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 the 8th of January, 1838. For full details the reader is referred to the "Annual Register" for 1839, pp. 9-12.

On the accession to the power of the Grey administration in November, 1839, 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 ever filled the latter post with less stress of both measures in all their details, the readiness and accuracy of his recollection, and even the talent of exposition and advocacy which he displayed, produced a general conviction that whatever lordship he had been enabled to look into 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 liable to be soon 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 death of Lord Spencer in the latter part of 1844, by occasioning this change, broke up the ministry. [William 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 office, and indeed that he had reluctantly been 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 remnants of the original Reform party, 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. He was succeeded by 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, his quitting of public life, and the execution of the measures of the House, if he did not support his population; 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 not only relieved from official occupation, but had nearly withdrawn altogether from politics and public life, both by the government, with more eagerness than ever to promote farming, the rearing of cattle, the patronage of agricultural associations, and whatever promised to advance his favourite science. "Regardless of expense and of personal inconvenience," says the author, "we have just quoted, he was always to be found to advocate and support 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 1839-40, when the meeting took place at Southampton. In the formation and operations of the Yorkshire Agricultural Society he also connected himself. He less prominently, but still 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 was one of the official members of the Boxhurghe 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 1855, in an address in which he says, 'I impute the fruits of those studies to you, because you were the inquirer in those inquiries—are beyond most men sensible of their importance—on the general in the opinions which I profess to maintain—and had ever 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 Paley's Natural Theology,' in 1844, are also supposed to be carried on with much of your time in these inquiries; the study of which much of his leisure is always consumed."

Lord Spencer died at his seat of Wiseton Hall, in Nottinghamshire, on the 1st of October, 1845. He had married, on the 14th of April, 1814, Esther, only daughter of Richard Bourchier, 2nd. Se., of Wiseton; he also died on the 11th of June, 1818, without issue; and his lordship succeeded in
the present by his next surviving brother, Frederick, now Earl Spencer.

(Memor in Gentleman's Magazine for Nov. 1845; Annual Register; Private Communication.)

20th February, 1846.

Conchifera, from the Cretaceous system of Kent. (Sowerby.)

Sphenacanthus, a fossil genus from the Coal formation of Scotland. (Agassiz.)

Sphenochinus, a genus of fossil fishes from the lins and walden series of England. (Agassiz.)

Sphenophyllum, a fossil genus of plants from the coal formations of Europe and North America. (Brongniart.)

Sphenodon, a genus of fossil fishes from the London clay. (Agassiz.)

Spider, [Arachnida, P. C. J. The habits of spiders have recently formed the subject of an interesting and valuable report drawn up at the request of the Linnean society of London 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 in the economy of spiders hitherto, it is said, unobserved and unimproved. For instance, it seems to demonstrate the possibility of the possession of any useful, 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 Mr. Adam White, 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 relate to the sexual intercourse of these animals, and to the purposes served by their palp 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 them we must refer to the report mentioned. We shall quote on a passage respecting the reproduction of the amputated palp—

'When the palp of male spiders which had been amputated before the penultimate moults are reproduced, the sexual organs, perfect in structure, 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 other males of the same species preserved their detached palp. That the function of the sexual organs is not in the least affected by their reproduction there exists the most satisfactory proof. In the last of those experiments, he notes, the palp was re-grown, while a part of the sexual organs in male spiders, recorded in this report, the male Tegenaria civilis, stated to have possessed the right palpus only when introduced to the female, is identical with the condition of the 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 its generative agency.'

Mr. Blackwall adds some very curious facts respecting the reproduction of spiders' limbs generally:

'Physiologists, in conducting researches relative to the reproduction of the limbs of spiders, seem to have limited their investigations to the legs of these 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 molting 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 proportionate to those of the corresponding limb on the opposite side, with the exception of the digital joint of the palp of male spiders when the sexual organs are not reproduced, which is usually somewhat modified in size and form by that circumstance."

11. The following facts, occasionally presented by spiders, are of no small consequence in their bearing on specific determinations—

1. Variations 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 Sestigous 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 former class of variations in 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 posterior 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 immovable 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 tarsus, connected with the base of the tarsal joint of the right posterior leg on its outer side, has been noticed in an adult female Lycosa caesarea.

4. Deficiency of the right intermediate eye of the anterior row has been remarked in an adult male Lycosa carbonica.

5. The left intermediate eye of the posterior row was perceived to be wanting in an adult female Epeira setacea, and the right intermediate was not brought to its usual size.

6. An adult female Cupiolo auro 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 setacea had not one-eighth of the natural size, being altogether wanting.

SPIKERNARD. [Nardostachys, P. C. S.]

Splanthus (from σπλάνθος, a spot, and ὀδός, a flower, because of its dotted or speckled flowers), a genus of plants belonging to the natural order Compositae and to the suborder Cynorrhynchia. It has a many-flowered head, either heterogamous with the florets of the ray ligulate, or homogamous with all the florets tubular and 5-toothed; the involucres is in two rows, appressed, shorter than the disk, the outer scales somewhat leafy, the inner rather membranous and folded up.

S. obovata has a branched diffuse stem, opposite stalked broadly ovate leaves, obvolute at the base, truncate or somewhat cordate. The pedicels are one-headed, longer than the leaf. The heads thick, ovate, and discoidal. The achene eliptical at the angles, bi-arristed or awoless. The whole plant, but especially the involucre and receptacle, acts as a powerful stimulant of the salivary organs.

(Lindley, Flora Medicinal.)

SPINELLI, PARRI, a celebrated old Italian painter, was the son of a Venetian artist, and was born at Ancona apparently about 1388-90, though his father was then very old, upwards of seventy. This conjecture however rests only upon Vassari's statement respecting the age of Spinelio, and upon the assertion that for their parents died three years and a half before the date of the birth of Mr. Parr. His birth is given as in 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, and afterwards by Benvenuto Cellini, who was involved in the preparation of the celebrated gates of the Baptistry of San Giovanni, which were executed between 1402 and 1484. He painted chiefly in Arezzo, and Vassari enumerates many of his works, but few now exist. He returned to Ancona, says Vassari, 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 1498, and his death is supposed to have happened about this time. Vassari's statement that he died in 1440 is probably a mistake as well as an error, as the account of Parr'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.

Parr was an excellent colourist, and was the best practical fresco painter of his time; his draperies were also good, but his figures were too long in proportion; Vassari says some of them measured as many as eleven heads in height, and yet they were not ungraceful.

[Vassari, Vite de' Pitteri, &c.]

SPIRITUAL COURTS. [BENCHEMICAL COURTS, P. C. S.]

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SPIROGLYPHUS, a genus of fossils from the mountain Jæstsmen of Iceland. (Mc-Coy.)

SPIRIFORA. [Cascoara, P. C. S.]

SQUALORIA, a genus of fossil fishes from the Five of Dorset, (Riley.)

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 at Padua, in 1584, and after living in Greece and Italy, lived there in great affluence and distinction till 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 numerous 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. (VENETIAN SCHOOL OF PAINTING, P. C., vol. xxii., p. 212.) Vasari terms him erroneously Jacopo Squarcione. (Ridlisl, Vite de’ Pittori Veneti, etc.)

SQUATIINA, a genus of cartilaginous fishes, of which the Fish of the name is formed from all the other sharks in the position of the mouth, which is closed at the extremity of the snout; and not placed below, in position of the eyes, which, instead of being on the sides of the face, are in the form of the flattened head. The body is very broad and flattened horizontally; the head is round. The dorsal fins are placed farther back than the ventrals, and there is no anal fin present.

STADE DUTIES are so called from Stade, in the kingdom of Hanover, 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 Brunsbaison Zoll is commonly used for, from the village of Brunsbaison, at the mouth of the Schwinge, where there is a customs-house and a royal guard-ship, and where the duties are collected that 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 40,000l. a-year. The duties levied were about 5% per cent. on all imports, more on some articles 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 the mouth of the Schwinge, as other foreign vessels were obliged to do.

By a convention between the King of Hanover and the other Elbe-bordering states (Emperor of Austria, King of Prussia, King of Denmark, Duke of Mecklenburg-Schwerin, Duke of Anhalt-Cotzba, Duke of Anhalt-Dessau, Duke of Anhals-Bernburg, Free and Hanseatic town of Liibeck, and Free and Hanseatic town of Hamburg), dated April 15, 1844, in conformity with articles 108 and 116 of Act of Congress of Vienna, of June 9, 1815, the Brunsbaison Tolls were revised, regulated, and settled according to the convention, as agreed upon by the contracting parties.

By a treaty of commerce and navigation between the Queen of England and the King of Hanover, signed at London, July 22, 1844, British and Hanoverian vessels arriving at the Hanoverian ports, or at other ports on the Elbe, not being vessels 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, remaining in, or departure from such ports. 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 free of all such duties or charges.

The 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 State or Brunsbaison 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 13th of April, 1844, and in the separate articles, regulations, and declarations to the said treaty, in so far, 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 pipes, wrought iron, cast iron, brass, copper, and 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 no other than, or in excess of, the duty or toll specified in the said articles. The treaty is to continue in force till January 1, 1844.


STANLEY, ST. LEONARD is a town and village, formerly a market-town (and described as still being one in the Article Gloucestershire, P. C.), in the lower division of Whiston hundred, in the county of Gloucester, about 3 or 4 miles W.S.W. of the town of Stroud, and about 12 miles by W. of Gloucester. The adjective to its name, St. Leonard, serves to distinguish it from two other Stanleys in the county, namely, the adjacent parish of King’s Stanley and the parish of St. Leonard, both near Winchcombe, in the same county. The area of the parish is 910 acres; the population at the different enumerations was as follows:—1801, 690; 1811, 638; 1821, 757; 1831, 649; 1841, 684. The number of inhabited 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. Swithin, and is an
STANZIONI, M'ASSIMO, Cavalieri, a celebrated Italian architect, was the pupil of Carlo Fontana. He has long had a fame as one of the first architects of his time. His works, as the Mascherina, Palazzo Molini, etc., in Venice, show a happy union of the antique and modern, of simplicity and elegance. He died in 1760.

(Parliamentary Papers; Ordinance Map; Forthroy's Gloucestershire.)

ANTHEMION, or the anthemion, is a plant belonging to the family of the Boraginaceae, and is found in the Mediterranean region. It is a perennial herb, with alternate, oblong, serrate leaves, and small, white, bell-shaped flowers. The calyx is tubular, five-lobed, and the corolla is white or pink, with five petals. The fruit is a capsule, containing many seeds.

S. saxatilis has spathulate leaves narrowed into a flat stalk, the calyx segments blunt, entire, and without intermediate teeth.

S. reticulata has spathulate leaves narrowed into a flat stalk, the calyx segments acute, denticulate. It is found in muddy salt marshes in Norfolk and Suffolk.

(Bahington, Manual of British Botany; Lindley, Vegetable Kingdom.)

STATUTE (Scotland). It would be difficult to explain the character of the old legislation of Scotland, the method in which it was sanctioned, or the constitution of the parliaments 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. Innes, in his preface to the edition 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 council of the Kynys; 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 nation, have been sanctioned by the king and "his judges." It is probable that the proceedings of the assembly, legislative or judicial, of the principal barons, though irregular, was in general an imitation of the parliament of England. Before the middle of the fourteenth century the lands 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 probably for the sake of better for them with 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 Saxons refugee 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 Soone, on the 9th of February, 1292, 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 adoption of the new term, which soon became in Scotland, as in England, the received designation of the great legislative council solemnly assembled. It was not till a few years later, on occasion of the parliament of Dunfermline, that the first in Scotland was probably at 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 barons of his kingdom. That treaty was finally ratified by the king at Dunfermline, 1295, and the seals of six barons were then affixed to the deed, and 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 barons, were actually present 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 by assemblies—were of a mixed character. Some were judgments in particular disputes, and were 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 regulations having the character of fixed and general laws. The 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 letters or other communications which 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 every original document is vivid, and the attempt to collate the results 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 capillars, and impressed 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, the acts of David I., the acts of the Parliaments, and the ordinances of Alexander II., as found in the old manuscript collections of lawyers, seem to be the fragments of various capitals of this kind. The acts 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 Quattor Burhorum,' 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 formed by his troubles and difficulties, which had previously 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. Burghs in Scotland and in the burghs of the technical phraseology is frequently used, which still belongs to the law and practice of England, but has long been discarded in Scotland. Indeed, it is very clear that, before the attempt of Edward I. to rule the realm, there was a harmony in the law and 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 English law with English legislation. English Justices, or officers of 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 undoubtedly a part of the English law in the sixteenth and seventeenth centuries it was very popular, as an understood national code; but it was subsequently discovered to have many features in common with the compilation 'De Legibus et Consuetudinibus Alamannorum' attributed to Ranulph de Glanvil, justiciar of England, and then it acquired the evil reputation of being a code prepared by Edward I., for the purpose of subjecting Scotland to the law of England. 'Upon an accurate collation of the books,' says Mr. Innes, 'it appears that the first part of the fourteenth and fifteenth centuries the local customary law of Scotland when they had happened accidentally, the vitiated or unintelligible text of the Scotch book is readily corrected by a comparison with the English author. There are, however, chapters in the 'Regiam,' which are not in Glanvil. Part of these are from the civil and canon law, and the remainder, joined inartificially to the surrounding text, appear to be genuine chapters of antient Scotch laws, most of which can be traced to their sources in the statutes of the earliest times now collected.' Mr. Innes does not believe in the theory that the 'Regiam' was prepared under the authority of Edward I., but thinks its resemblance to the English compilation may be attributed to the spirit of imitation. The 'Regiam Majestatem,' so named from the words with which it commences, is, with the burgh laws, and other vestiges of early legislation, printed in the first volume of the edition of the Scottish statutes issued by the Record Commission. None of the contents of this first volume, however, come within the description of the accepte statute law of Scotland. They are curious vestiges of constitutional history; and are, for the most part, of no settled principle of law by a reference to its origin, these old collections are sometimes referred to; but they are not admitted as direct authority in the substance of the law. The earliest reference to the publication of the statute law, and they specifically published a series of statutes reaching from 1424 to 1564. It is at the former date that the statute law, properly speaking, commences, and it proceeds thence in a regular series to the Union with England. Several of the most important statutes still in force—as, for instance, that which secures to the agricultural interests of Scotland the security of the tenure of the death of the landlord by whom it may have been granted—date back to the earlier part of the fifteenth century. The Scottish acts are referred to by the date of the parliament in which they are passed, and their numerical order: as, the 'Statute of Scotland Act 1424,' c. 25; 'The Act 1661, c. 16.' The early statutes are brief and sententious, and were admired by Bacon for 'their excellent brevity.' The following are two such statutes:—

Item, it is decreed be the hall parliament, and forbidden be our sovereign lord the king, that any leagues or bandes be maid amongst his lieges in the realm; and gif one has been made in time bygone, that they be not kept nor halden in time to com.'

'Item, it is ordained that no horse be sold out of the realm, quhilt at the least they be three yeir aird outgone, under the pene of escheat of them to the king.'

From the date of the accession of Bruce, after the war with England, the Scots long entertained a feeling of national jealousy and enmity towards England; and though some of the kings of Scotland were in constant communication with their English counterparts which had resulted 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. Burghs in Scotland and in the burghs of the technical phraseology is frequently used, which still belongs to the law and practice of England, but has long been discarded in Scotland. Indeed, it is very clear that, before the attempt of Edward I. to rule the realm, there was a harmony in the law and 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 English law with English legislation. English Justices, or officers of 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 undoubtedly a part of the English law in the sixteenth and seventeenth centuries it was very popular, as an understood national code; but it was subsequently discovered to have many features in common with the compilation 'De Legibus et Consuetudinibus Alamannorum' attributed to Ranulph de Glanvil, justiciar of England, and then it acquired the evil reputation of being a code prepared by Edward I., for the purpose of subjecting Scotland to the law of England. 'Upon an accurate collation of the books,' says Mr. Innes, 'it appears that the first part of the fourteenth and fifteenth centuries the local customary law of Scotland when they had happened accidentally, the vitiated or unintelligible text of the Scotch book is readily corrected by a comparison with the English author. There are, however, chapters in the 'Regiam,' which are not in Glanvil. Part of these are from the civil and canon law, and the remainder, joined inartificially to the surrounding text, appear to be genuine chapters of antient Scotch laws, most of which can be traced to their sources in the statutes of the earliest times now collected.' Mr. Innes does not believe in the theory that the 'Regiam' was prepared under the authority of Edward I., but thinks its resemblance to the English compilation may be attributed to the spirit of imitation. The 'Regiam Majestatem,' so named from the words with which it commences, is, with the burgh laws, and other vestiges of early legislation, printed in the first volume of the edition of the Scottish statutes issued by the Record Commission. None of the contents of this first volume, however, come within the description of the accepte statute law of Scotland. They are curious vestiges of constitutional history; and are, for the most part, of no settled principle of law by a reference to its origin, these old collections are sometimes referred to; but they are not admitted as direct authority in the substance of the law. The earliest reference to the publication of the statute law, and they specifically published a series of statutes reaching from 1424 to 1564. It is at the
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 sub-
scription to the Act of Parliament—"The Athenaeum Record at
Westminster." The remedy for this evil appears to be, to incorpo-
rate with each act a clause stating the terri-
torial extent of its application; and whenever it is intended
that it shall apply to Scotland, to have clauses especially appli-
cable to its enforcement in that part of the empire.

STATUTE OF FRAUDS. This name is applicable to any
state the object of which is to prevent fraud, but it is par-
special 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 reversion
could only be conveyed by deed. The statute of frauds de-
clares that every contract for sale of an estate for a greater
period of years, or any uncertain interest in any lands or heredi-
ments, made by livery and seisin only, or by parol, and not
in writing and signed by the parties, &c., shall have the force
and effect of a principal point to be proved in any suit for
more than three years, whereas 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
the soil or reversion, or any estate or heredita-
ments, shall be manifested and proved by some writing
signed by the party who is by law enabled to declare such
trust, or by his last will in writing, or they shall be void.
The fifth section, or the other, or the different in the
relation to the revocation of a devise in writing of lands or
tenements, as more particularly described in this section,
should be in writing and signed in the manner here prescribed
by three or four credible witnesses; and the 6th section
related to the revocation of a devise in writing of lands or
tenements, which may be omitted here, as the object is to show merely
that the purpose of the statute is to prevent fraud by requiring the
evidence of writing, which is a better kind of evidence than
parol.

STATUTE MERCHANT. [Acton Burrell, Statute
of, P. C. S.]

STATUTE STAPLE. [Staple, P. C. S.]

STATUTE SHIP. [Screw or ARMERIES, P. C. S., p. 111, and STEAM VESSELS, P. C. S., 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
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 'Athen-
aeum' for 1844, p. 114, are 590 feet long and 560 feet broad in
the widest part, drawing 16 feet 8 inches. In capacity is
about 5000 tons, and the engines, consisting of four cylinders of
88 inches diameter and 72 inches stroke, are of 1000-
horse power; and, although the screw-propeller was not at the
greatest ever launched, was fitted, on her completion in 1845,
the screw-propeller 154 feet in diameter, with six arms, mounted in
the stern, and capable of being turned with great rapidity
by a person standing on a circular platform, which was
immediately connected with the engine by a cord, which
motion through an endless chain to a much smaller wheel
fixed on the shaft, which constituted the axis of the prop-
eller. The propeller was thus turned with a velocity ex-
ceeding that of the crank-axis in a ratio determined by the
relative diameters of the larger and smaller chain-wheels.

Thus mounted, and driven by the engine, the ship 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 26th, 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),
wherein she was left for some time wholly dependant
on her sails, in consequence of the shattering of the propel-
lor, she was fitted with a new and much stronger prop-
lor, 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 repaired, her number of weeks reduced to
five, and the whole stepped upon the keelson. With these
alterations, in an experimental trip made on the 50th of May,
1846, the Great Britain attained a speed of 14 knots,
and a speed still greater was attained on a voyage

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
sessions of the Institute of Mechanical Engineers, from
February 25th to 29th, 1844. In the course of this discussion,
which a full report was published in the 'Mechanics' Magazine,'
vol. xl. pp. 201-209, it was remarked by Mr. Bennie that the
steam-propeller was at a second stage of development,
which shall offer but little obstruction to the water, and yet
act upon it so as to exert full power in propulsion;

very large portion of a complete screw having no useful effect,
the water has been observed to flow without the aid 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 it for granted, in the chapter of the 'princ-
ple 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 from
between the screw blades, a mass 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 ques-
tion, upon the true comprehension of which the best shape,
size, position, and velocity of the propellers must depend, we
may observe with Mr. Farcy that while the advantageous
action of ordinary paddle-wheels is greatly impai by varia-
tions in the degree of immersion, the submerged screw prop-
eller, 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,
neither the greatest variations of draught from the
the lading of the vessel. 'When all circumstances were con-
idered,' Mr. Farcy, observed, 'it might be safely concluded
that vessels fitted with revolving submerged propellers
would enable the greatest possible number of vessels, and
summer; 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 ma-
achinery may be such as to render the vessel far more com-
venient, and, if desired, to leave the upper decks open from
end to end. These, among other advantages, recommend
this mode of propulsion for frigates, and other vessels of
war. The Princetowan, an American steamer-frigate, launched
about the commencement of 1844, and mounted with
Eriksen's transversal screw-propeller, affords a good example of
the advantages of the invention in application to ship-
building.

This vessel, which, according to an account quoted in the
'Athenaeum' for 1844, p. 206, from the 'New York Herald,'
is of 700 tons burthen and 250-horse power, has a submerged
propeller making 70 revolutions per minute, and is capable of making its way through a current of
14 miles per hour, or even somewhat more, as is said to have
bathed the Great Western in speed, although drawing at the

Since the above was written, the M. athens vessel was again appeared in the Bay of Dardanelles, between Batavia and Dacca, the screw-propeller engines,
which were used outward voyage, in the night of September 26, 1846; and though the spring-
tides have since taken place, her performance (Oct. 25, 1846) been g
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. Braithwaite stated them, as above referred to, to be 164 feet long on the water-line, 22 feet 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 horse-power, and the velocity of steaming 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. Braithwaite’s would indicate a very unusually high proportion of power to tonnage, that of the New York Herald shows the usual proportion for fast vessels. The engines, according to Mr. Braithwaite, are of peculiar construction, having two steam-cylinders or chemical engines, each consisting of six large, peculiar, circular plates, with cranks attached to 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 bands 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 only the problem remaining for solution, and that difficult problem was overcome, and steam-propellers must necessarily, 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 New York Herald, how great advantage would mounted 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 Great Western, and other steam-ships of the ordinary kind, the 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 prevent 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, 60 feet long, 12 feet 6 inches beam, and drawing 5 feet 6 inches. She was mounted with a wheel 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 the Institute, 5 feet 4 inches diameter by 20 inches long, of which 13 only were immersed; a part of the propeller being constantly above the water. It was turned with a velocity of 95 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 16 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 sectional displacement 25 feet, she was found, in a number of experiments, capable of beating all the steamers upon the Mersey, excepting the large sea-going vessels, and was proved to have a great superiority over other steamers in towing vessels out in a heavy 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; and it is intended by the introduction of it to increase the efficiency of the rudder. Under the impression however that a contrary result takes place, it was proposed, in Maudsley’s patent of 1843, 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 calm and contrary winds. The English ships Audacia and Euphrosyne, which are regular sailing vessels, fitted with conveniences of a very superior order, is provided with a small Ericsson propeller, 9 feet in diameter, and has 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 the Audacia made the voyage, from February 22 and November 18, 1846, 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 16,000L. In a similar way an auxiliary screw-propeller is ordered to be fitted to the Amphion frigate, which was launched at Woolwich in January, 1846, and which, though she is to be furnished with a screw of 15 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 that the British navy with her machinery entirely below the water-line, as in the American frigate Princeton.

These destructive investigations of the history of screw-propellers, and the attempt at their application to the construction of new vessels, are the subject 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 a screw was contrived by Professor Franklin; 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.

STEENHAMMAKER, a genus of plants belonging to the natural order Boragineae. The calyx is divided into five deep segments. The corolla bell-shaped, with a short cylindrical tube with 5 minute protuberances in its throat. The stamens protrude beyond the throat, the stamens elongated.

S. martima, the only British species, differs but little from Lithophragma except in habit. It has a procumbent branched stem, ovate, acute leaves, with rough, hard dots, glabrous, fleshy, and glaucous, having a taste resembling oysters. The nuts are smooth. The flowers in racemes and of a purplish blue colour.

(Babington, ‘Manual of British Botany.’)

STEVEN, or Jacob QUÉS, born at Lyon, in 1565, his father, François Stella, who was also a painter, died when he was only nine years old. Notwithstanding the early age at which he lost his father, Stella is said to have had no other master. He was the son of a rich merchant of Lyons, and when he was employed by the Grand-Duke Cosmo II. to execute the decorations which were designed for the celebration of the marriage of his son 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 1625, and contracted a friendship with Ponzio, 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 masqueraded himself in a drawing on the wall, in chalk, the figure of the Virgin with the infant Jesus in her arms. A report of the excellence of the drawing reached the Cardinal Barberini, who went to see it, and from that time a bright 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 him the title of baron; he declined the proffered honor, and went on to Spain, whither he had been invited by the king. Cardinal Richelieu however succeeded in detaining him in Paris; he procured him apartments in the palace of the de Montmorency, 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 he exaggerated the defect of Poussin: many of his pictures are very red. He excelled in pastoral pieces and at the age of twenty-seven he had engraved some 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 large etching of the Presentation of Tribute to the Grand-Duke of Tuscany, of the date 1621, which is very rare. Many woodcuts, apparently by P. Maquin, are marked 'Stella feitt,' but this alludes to the design, not the woodcut.

(Felician, Entr’o, ord.; D’Argenville, Vies des Peintres, etc.; R. Dumenil, Peintre-Graveur Francais.)

STENEOBIAUS, a crocidilion genus of fossil Silurian marine snails. The type is E. cereale, the index fossil which forms the Triassic-Permian boundary. (Goodrich.)

STENELYTRA (Insects), the third family of heteromorph Coleoptera in the arrangement of Latreille. Holops, Cistel, Derex, and Stenemera are examples. They are known by the convexity of their antennae which are thickened at their extremities. They live under the bark of old trees, or on leaves and flowers.

STERNBERGIA (Bronnmiart), the generic name for a stemless plant from South America, apparently. In the subfamily of the Polygalaceae by Bronnmiart. Mr. Daws has compared it to the interior of some tree stems in which the pith is transversely divided by phloem. It has been also named Artisia by Pfeil.

STERNOPTYX, a genus of small flies belonging to the order Salaminidea, though very different in aspect from salamandrous or trout-flies. 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 immersing 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 retention to a great degree of the flavour 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 earthenware, of Adams clay, and as a confession of 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 and easily destructible confections. They must be kept very clean, and the timing always perfect. If this be rubbed off acid and saccharine liquids form poisonous compounds, which produce serious and occasionally fatal effects.

When several stews or made-dishes are prepared 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 kept always very hot, but must not boil; the effect of this is to keep everything warm without altering either the quantity or the quality, particularly the quality.

'Gentle stewing is incomparably 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 get the bad. The full flavour of the ingredients can only be extracted by long and slow simmering; during which, take care to prevent evaporation by covering the pot as closely as possible.'

(Dr. Kitchener’s Cook’s Oracle.)

STIEGLITZ, CHRISTIAN LUDWIG, was born December 12th, 1766, at Leipsig, in which city both his grandfather and father were persons of station, the former, who died in 1736, a burgomaster, and his father, a wealthy merchant, and an officer of protocol. Surrounded at home with objects of art, for his father possessed both a collection of pictures and a cabinet of medals and minerals, Stieglitz imbibed from them almost in his childhood those tastes which so assiduously cultivated throughout life, although they were altogether remote from his other studies and occupations. Though he set his father’ s study in 1771, and in 1773 he published in Leipzig a treatise on law, he wished he applied himself to jurisprudence and other studies at the university of his native city, where he attended the courses of all the most eminent professors of that day, Ernst, Clincker, Platzer, &c., and took his law degree in 1777, and in 1784 that of doctor of laws, on which latter occasion he produced his dissertation 'De Caesis cur Jus Feudales Germanicum in Germania ngestem cit.' In the latter year he devoted all his time to literature and art, and in 1775 made his first essay in poetry, in which, if he did not distinguish himself, he continued occasionally to exercise his pen, for he contributed many pieces to a collection of Kriegslieder, or War Songs, published in 1776, and in the published 'Wartburg,' a poem in eight cantos, which appears to have attracted so little notice, that though biography 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 which had hitherto been neglected. In 1781 he published an essay on the fashions and fancies of the times in 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 under a similar guise, as papers in the Allgemeine Correspondenz of the chief member of the Bathicollegium, or Council of Leipzig, he first brought out his 'History of the Architects of the Antients' (‘Geschichte der Baukunst der Alten’); and immediately afterwards engaged in a work of the same kind, the 'Encyclopedia of Civil Architecture,' in five volumes, the first of which appeared in 1792, the last in 1798. In the interval he brought out a work upon Modern Gardening, which came to an end without competition. The latest production was his 'Artistische Blätter' (1800), a collection of papers on Decoration. In 1804 he began to publish, under the title of 'Zeichnungen aus der schönsten 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 inartistic 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 Ellis, of Batty and Adam, 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 be understood.

Whether it was owing to his being satisfied with what he had then done for architecture, or afterwards dissatisfied with his last work, some years elapsed before he again published anything on the subject, turning in the interim to studies more professsionally archaeological; the fruits of which were an essay on Medals and Collections of Coins,' 1809, a treatise on the 'Pigments employed by the Artists of Antiquity,' 1818, and 'Archaeological Undercurrents,' 1820. In the same year with the last-mentioned publication came out his excellent work on Ancient or Medieval German Architecture (Alt-Deutsche Baukunst), which contributed not a little to direct attention to and inspire that study 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 periods, that appeared in the first editions of which appeared in 1827, and the second, a greatly enlarged one, in 1837. Contrary to the opinion of Hirt (Hirt, P. C. S.), Stieglitz contends very strongly that the characteristic features of the Gothic were developed in the characteristics from an original construction of stone, and not of timber or wooden framing. The list of his literary labours is further extended by his 'Distribuzione Numismatica Germaniae,' 1833, and 'Geschichte der Ausbildung der Baukunst,' 2 vols., 1834; and it would be prodigiously increased were it possible to enumerate...
all the various articles which he contributed to the 'Ieremon,' the 'Kunstblatt,' and other journals; and to Ezech and Grätz's 'Encyclopedia.' After having held the office of professor of the military history of Leipsic, he was appointed one of the assessors connected with the town government, Stiglitz retired from public duties in 1830, though he retained the title and distinction of proconsul; and in 1834 the 'juveniles' or fifteen annual volumes of his works was celebrated at his townsmen, and a silver medal was struck and presented to him on that occasion. He died July 17th, 1836.

In Forster's 'Bautzzeit' for 1838 there is a portrait of Stiglitz accompanying a full memoir of him, which we have made use of for this article.

STIGLZI{ER, JOHANN BAPTIST, the late distinguished director of the Royal Bronze-foundry of Munich, was born on the 29th of June, 1776, at Fürstenfeldbruck, a small market-town near Munich, where his father carried on the business of a blacksmith. At Fürstenfeldbruck is an old foundry converted by Ludwig the Strong, of Bavaria, in atonement for the hostile execution of his innocent wife Mary of Breslau, in 1780. This converted, 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-ofohlenhau). 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 Stiglizer's academy, and in the library of which there was a reprint of the woodcuts of a book on natural history, which, with a catechism and prayer-book, constituted the whole library of his family. These woodcuts and the decorations of the convocation were diligently copied by Stiglizer, who was so busy painting away that he was obliged almost to go daily for milk), at length ventured to introduce himself to the superintendent of the establishment, Herr Pfieffer, who he heard was not only himself a drabman, but possessed of some real painting energy, and gave him some regular elementary instruction in design. After this he was placed by his parents with a goldsmith at Munich, of the name of Streel, and he attended in the meantime the holiday school (Ferienkurse), 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. Leprieur, the director of the Bavarian mint, who from this time took much notice of Stiglizer, 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 for Von Langer, the director of the Academy, on one side, and Moses making the water flow from the rock on the other, which he was appointed to the engraving 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 Stiglizer's great patron, Ludwig, the King of Bavaria, (then Prince) first became cognizant of his high abilities, and appears himself to have directed Stiglizer's attention principally to metal-sculpting, in preparation for his own great undertakings already projected by him. In reference to this future occupation Stiglizer repaired to Naples to witness the casting of the bronze colossal equestrian statue of Charles III., to be directed by Francesco Righetti and his son Luigi, from the model by Canova; the Italian sculptor's reserve and jealousy, however rendered Stiglizer's journey in vain as regarded its principal object; he did not allow him to see the casting. But in another respect he was fully compensated; after considerable trouble he obtained permission to erect a pedestal, sconce and cenotaph in his cellar, and having procured the assistance of Beechest, an experienced foundryman, then to be found even in the principal cities of Europe, he undertook 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 the journeyman, Pasquili, in his ecstasy kissed the tip of his pencil, which he had so long been searching for in vain, because he had not the courage to write his own name on it in true Roman style. 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 Sculpture Gallery or Glyptothek then in progress. To the medals of this time belong that in commemoration of the marriage of the King of Prussia, for the minister Von Zentner, and the various medals for the Equestrian statues of Louis Napoleon, which were those of King Maximilian I. and the Queen Theresa, Count Döring, the ministers Baron Von Zentner, and Lerchenfeld, Bishop Streber, and others.

In 1824 Stiglizer published a work 'On the great variety of metal castings, and from this time he was exclusively employed in founding the numerous monumental works which have been executed for Ludwig I., the present King of Bavaria, some of which are the most extensive castings of modern times. In order to be as well prepared as possible for this arduous task previous to casting any great monument, he visited Berlin in 1824, to witness the casting of Rauch's colossal statue of the Elector Maximilian I., which showed him everything in his power. Stiglizer's great activity commenced with the reign of Ludwig 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 Franklin Von Mannlich, in the cemetery at Munich; the monument of Maximilian I., in the cemetery at Munich, the monument of the parting of Otto, king of Greece, from his mother Therese, queen of Bavaria, at Ailing; after Schwanthaler—the twelve colossal fire-gilded statues of the ancestors of the King of Bavaria, ten brass statues of the ministers of the King of Bavaria, the statue of General Bekker for his monument in Munich; the colossal monumental figures of Jean Paul in Bayreuth, Mozart in Salzburg, the Margrave Frederic of Brandenbourg in Erlangen, and the Grand Duke Ludwig in Karlsruhe, and the gilt bronze pieces of table-service, with designs from the Nibelungen and Aenomenia, for the crown-prince of Bavaria; after Thorwaldsen—the statue of Schiller at Stuttgart, and the monumental statue of Baron Stiglizer, and the monument of the gilded candelabra in the new throne-room in Munich; the monument to the brave Oberst Streissl, at Aibling, and the monument to the hero of the battle of Leipzig, and the tomb of King Maximilian I. in the royal vaults (Fürstengruft) at Munich, after a design by the architect Ziehend. Besides the above works, which are completed, are the following练习 the casting of the busts of King Ludwig III., and Stiglizer's death—the colossal statue of Goethe, for Frankfurt, after the model by Schwanthaler; and from the model of the same sculptor, the enormous colossal figure of Bavaria, nearly sixty feet high, to be placed before the Baldur's temple of Fame, or Ruhmehalle (now in progress in the suburbs 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 Schwanthaler, the monument of the late Grand-Duke of Baden, with a pedestal and four allegoric figures of the four circles of the dukedom; and the statues of Marshal Tilly and Wrede, for the now marquis' Leggira or Feldmühle at Munich; and cast from Thorow's models of the statues of Ferdinand, king of Naples, and of Bolivar, for Boliva, in South America.

Stiglizer died March 2, 1844, on the day on which the statue of Goethe was cast by his nephew and assistant Ferdinand Miller. Stiglizer had suffered from illness two years previous to his death, and many supposed it was owing to the unhealthy system of gliding by fire; but he died of a cancer of the tongue, which, while he was a physician, had previously declared to be the cause of his illness.

(Kunstblatt 1844: Seel, Bildende Kunst in München.)

STIGMANN, A genus of fossil plants allied to Lyopo-spermum, and which probably inhabited the beds of coal, whether Silurian stand over these beds or not. It is most abundant in the lower parts of the true coal formation.
STILL, 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 History of Living Things at the University of Suffolk and Yorkshire, and was subsequently Master of St. John's and Trinity Colleges. In 1658 he was chosen proctor of the convocation; and, in 1693, he was raised to the bishopric of Bath and Wells, which he held till his death in 1707. 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 lead mines discovered in the Metalliferous district during his possession of the see. The historians of the drama concern in believing him to have 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 English by the name of a comedy. It is called, 'A Rhytg plity, pleasant, and merio Comedy, intytuled, Gammer Gurton's Needle, played on stage not long ago, in Christia's Collage in Cambridge. Made by Mr. S. Master of Art, 1675. 'Gammer Gurton's Needle' is in Hawkins's 'Origo of the English Drama,' and in the second volume of Dodsley's 'Old Plays.'

The soil of the county and the towns are very much affected by the tribe Stipocem.

It has staked stumps, the palisades, the inner entire.

S. parvula, the only British species, has a very long twisted feathery twin, with a glossy base. It is a very beautiful plant, and is found in our gardens. Found on rocks in Long stead near Kendal.

(STINNETT. Manual of British Botany.)

STOCKADE, in Fortification, is the name given to a wall constructed on the principle of the great Henry Maudsley's towers, 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 loops are tied through them, on which the trees, 8 inches long are cut down, vertically, from the top, through which the defenders may receive a fire of musketry on the assailants. An inclosure of timber so planted is sometimes called a Pillars, from the French word pillar (pioter). The first fortifications of the French, 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, trees, and rude paraphernalia, 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 Plataea during the siege, and the blockade of that city by the Romans, are stated to have been made, in this manner, in a double line with a certain interval between the lines (Thucydides, ii. 75); and the fortresses of the Drile, a people inhabiting the shores of the Euxine Sea, are described by Strabo as consisting of a similar kind of blocking, called embankments, on the latter of which were palisades and wooden towers.

The description of the Pha, or Hipahs, 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 scafolds whose heights from the ground were three feet less than that 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 hollow place in which the women and children, with the provisions, were deposited. The pales are generally on the summits of heights, and they are sometimes strengthened by outworks of a similar nature.

On the frontier of the United States of North America, during the war, the planting of roughly-hewn trunks of trees planted close together in upright positions and pierced with loop-holes for musketry, are very frequently constructed for the purpose of inclosing an area which is to be defended; and in that way the foundations of a fortified house, 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, P. C.]

STONE FOR BUILDING. The durability of stones may be examined in several ways, and results of much importance in the arts have been actually obtained by some lately. Investigations set *on* foot for the purpose of 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 weather and mechanical agencies connected with the atmosphere and dependent on the climate. Rocks which are composed in any considerable degree of carbonate, or carbonate, are cement, or which contain minerals into whose composition alinate of soda and various other acids, is stilled, is less favourable to their preservation. Not only the freely consolidated chalky rocks (like that of Mestersham), but the more solid Oolite of Bath and Portland, these rocks, or in the interior of the ancient towns, are often the same of the firmer most limestone of Derbyshire or half-crystallized and half-silicified marble of Yorkshire, being incapable of preserving its edges and angles from slow decay and disintegration, even in the most remote regions of the height of the mountain, 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 withstood 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 these. Limestones of this kind are the class of sandstones which comprises every degree of bad quality, but scarcely the highest degree of good,—the imperceptibly decaying millstone grit of the Drulwich Tills at Boroughbridge with the Craven limestones, to which the architectural beauties of Carlisle, Chester, and Coventry have been unfortunately wasted.

Granite scarcely merits universality, nor even generally, the reputation of a very durable stone in Britain. Some of the Cornwall 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 Killinc, 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 action of the chemical action of water, by which it is converted into the powder of heat and cold, of alternate wetness and dryness, and the change of the men of that which is compacted with the quartz and micas 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 burnt 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. Stonework must in general be freestone firm enough to sustain great pressure, and yet so aggregated as to admit of being worked with 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, much changed by the growth of lichen, the access of moisture, and the change of the contained iron. By so many conditions, indeed, is the choice of stone limited in a particular case, that very few samples of stone are really placed at the disposal of the architect.

In the great variety of limestones and sandstones which are adapted for building purposes, we remark, by the aid of the microscope, three principal modes of molecular aggregation: mixtures, which are aggregates of crystals; and compacted crystallizations.

To give an idea of the applicability of this classification, we...
may shortly review a small series of sandstones arranged in a geological sequence. None are mentioned except such as have been much used. Those which are not really freestone or which have not been found tolerably durable are inclosed in parenthesis.


Cambrian. Serpentine stone used in Serpentine, a mixed mass. It hardens on the surface by exposure.

The 'calcareous grit,' as it is called, of Yorkshire. It is a mixed mass (with little or no carbonate of lime). It is used at Doncaster Park; hardens by exposure.

The 'Kelley's' rock of Yorkshire: a soft mixed mass, very slightly calcareous, hardens by exposure. Durable in the vicinity of Hardness.

The ferruginous sandstone of the inferior oolite: a mixed mass; 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, Glan's grave. &c. (Other specimens of fine grain are among the worst stones of the district.) A light coloured sort, called 'Keuper', quarried near the Malvern Hills, is durable.

Palaeozoic. (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 Brimham, 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 magnetic 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 large cellular mass, the interiors of the cells being either compactly crystallized or filled with a soft earthy mass. In fine examples of this stone, as those of Mansfield, Bolsover, Anston, Boche, and Huddersfield, the cellular 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 used in building, but seldom very tractable in ornamental work, except the softer beds of the marble-season are adopted or imitated. It is in one considerable proportion of limestones, though, generally only a mixture of grains. These are in a considerable proportion of organic origin. The magnesian varieties of Derbyshire have more the character of ordinary freestones than the other varieties.

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 various or very distantly related parts, as millstone-grit; concretions which have earthy textures in their interstices, as some oolite limestones; crystallizations which do not produce compactness, as in some magnesian limestones, and not in compactness, as the Serpent stone, the Colwick sandstone, and some mountain-limestones; concretions of adherent globules, as the oolites of Kettering; concretions of globules cemented by sparry interstices, as the oolite of Anston; 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 inhibition of salts which expand in crystallization, and to mechanical pressure. And there remains one further class of evidence more important in all respects. By observing how the various sandstones and limestones 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. D. de la Boche, and Dr. W. Smith) who reported on the choices 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 these stones, 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:
proved to be the Bath oolite from Box; that most in
herited by Brand's artificial process of disintegration was the
Barnack stone; and that which was most easily crushed was the
Bath oolite from Box. Generally speaking, Stones of the
waste which least absorb moisture least disinte-
grating; sandstones appeared to be strongest, though choice
magnesian limestones (as that of Bolsover, finally recommended
by the Commissioners) were fully equal in this respect, and
were almost as little absorbent. (Report of the Commissi-
oners, 1839.)

A few remarks on the appearance presented by stones in
decay may be of some service to the collector. Stones of
the same texture commonly 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
baked at the surface. An unusual enveloping crust is then
formed, as at Stonehenge, where the interior is soft, but the
outer hard. This process appears to render such a stone
durable. But if carried further, so as to produce a new
texture of the surface, the external shell separates from the
interior mass, desquamates 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, also 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 effect of the mode in which the original particles
are held together.

Again, the circumstances under which a stone is exposed to
a building influence its conservation. It is not the amount but
the kind of exposure which governs the decay. The southern
and western parts of Yorkshire and the north and
eastern parts of Hampshire. Prominent cornices are often perfect,
while below them the mouldings are reduced to shreds.
The drip-mouldings remain and is even hardened, while the parts
which it was destined to protect least moulded away. This
has actually occurred to the observation of the writer in the
space of only a few years. In fact since 1833 the same
pieces of magnesian limestone remain perfect in the drip-
moulding, showing every chisel notch, in the whole orna-
timents, while the rest have been totally decayed.

STONE, NICHOLAS, master mason to Charles I., was
born at Woodbury, near Exeter, in 1668. 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 1610, 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-
missionment of the King's Arms, he gave the designation of
master mason of Windsor Castle. The patent is in Rymers' Fodera, vol. viii., p. 678. The history of Stone's works is
fully recorded by himself in a pocket-book, which was in
the possession of Mr. Hawkinson, and is now in the hands of
Mr. Vertue. Stone 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 1641 a monument
to the Earl of Ormond, at Kilkenny, for which he received
400L. He received in the following year 500L for a monument
to Henry Howard, earl of Northampton, erected in Dover
Cathedral. For a tomb made for Lucy Harrington, Countess of
Bedford, 1616, he bargained for 1000L, besides the charges
for carriage and iron and setting up. This year he went to
Scotland, where he had business in transactions there—July, 1616, was I sent to Scotland, where I undertook to do work in the King's Chapple and for the King's Closet, a great part, so much as came to 400L of which I have finished. I performed and had my money well paid, and 50L was given to drink, whereof I had 20L given to me by the king's command. He mentions drink-
money on other occasions. Stone made several monuments for
Queen Elizabeth and for Henry VIII., and received 101L, 17s. 8d. for the post, for which the Countess of Dorset paid him 404L.

In 1625, he made for the Old Exchange of London four
monuments—Edward V., Richard III., Henry VII., and Queen
Elizabeth; for which he received 123L, 10s. 4d. For the three kings he received 252L, each, for the queen, 30L. 25s. appears to have been Stone's ordinary charge for a
monument, 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 own account, to 20,000L. From whom Vertue
acquired his information concerning Stone's family, to 10,880L.
Walpole has given a list of the principal monuments, and
mentions some architectural works by Stone. He died
July 24, 1641, and was buried, according to Michaelmas'
Church, where there is a slab to his memory with an inscrip-
tion and his profile. His wife and son Nicholas are buried in
the same grave: they both died in the same year a few months after him. Stone had three sons, Henry, Nicholas, and John.

Henry Stone, known as Old Stone, probably because he
was the eldest, was a statuary and painter, but he was chiefly
engaged in painting. He studied in Italy and the Netherlands,
and made many excellent copies of celebrated Italian and Flem-
ish pictures; there is a large copy at Hampton Court of the
celebrated picture, by Titian, of the Coronna 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 for the crown for 10L per annum. He died in 1653,
and was buried near his father; and the following inscription
to 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 the profession of his art and languages.
In the prime of his life on the 24th day of August, a.d. 1653, and
lyched buried near the pulpit in this church." Here follows some laudatory
verses. Old Stone wrote a book, entitled 'The Third Part of
Stone's Account of the Art of Painting,' in which he described many cele-
brated works. Mr. Bird, the statuary, says Walpole, had the
'Lacoon' and Bernini's 'Apollo and Daphne' in terra-cotta
by him. He returned to England in 1642, and died in the
same year as his father, as an infant, and his brother saw a
book of drawings by him of many buildings in Italy.

John Stone, the youngest, was also a statuary, though
he was originally designed for the church, and was educated
at Oxford. In the civil wars 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 afterwards engaged in partnership with
his brother Henry. He wrote a manual on Fortification,
which he called 'Encliridion;' it contained many small en-
tched by himself, but without his name. He died soon after
the Restoration. In St. Martin's Church, below the inscrip-
tion to Henry Stone, is the following addition, with the date,
June 1869:

*In memory of whom their near kinsman, Charles Stoakes,
repaired this monument."

(Walpole, Anecdotes of Painting in England, &c.)

STORM-SAILS. [Sailes, P. C.] 2

STORMS. [Tornado, F. C.; Whirlwind, P. C.] 2

STORY, JOSEPH, a judge and juridical writer

known to law students as Mr. Justice Story, was born on
the 18th of September, 1779, in Marblehead, in the State
of Massachusetts, U.S. He received the rudiments of learning
in his native town; entered Harvard University in 1798, and
took a degree there in 1800. He commenced his law studies
under Mr. Samuel Putnam; after Mr. Sewall's death, he entered
the bar of Marblehead, subsequently engaged in the chief
justice of Massachusetts, and finally in 1809 he was appointed
under Mr. Putnam, of the bar of Salem, who became a judge of
the same court. In 1801 he was called to the bar, and
speedily obtained extensive practice. In an article in the
Law Review, the author of which enjoyed his friendship,
"it is stated that, 'from political considerations, he was very
early engaged in important causes, in which he had to com-
front the opposition of his political opponents, and, not unfrequently,
sustained the conflict alone.' His reputation at the bar has never been surpassed by that of any of the eminent lawyers of whom the United States can boast. In 1809 he became a member of the State Legis-

lature of Massachusetts, as representative for his district.
He continued a representative until his accession to the bench;
and he then was elected to the office of Speaker. In 1809
he was chosen a member of Congress, as representative of the Knox South District. He acquired a high reputation as a person of sound sense and good judgment. In 1818, he was appointed an Associate Justice of the Supreme Court of the United States. 'The jurisdiction of this court,' says the authority already cited, 'both original and appellate, extends to all cases arising under the said treaties, and the municipal laws of the States, the common, and many of the statute law, as well as the system of equity jurisprudence of England; it had to administer parts of the laws of the Confederate States of America since 1861. It is remarkable that for his eligibility on this occasion he was again indebted to the accident of his being a native of Delaware. He was also elected by the same society a College tutor in the course of the already. In March, William (afterwards Sir William) Jones, who had recently left Oxford for the metropolis. In 1787 he took his master's degree; and in May, 1789, he proceeded B.C.L., having by this time published a volume of Dissertations. He was appointed 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, 1789. 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 conversation 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 high and wide reputation. It is said that they exist still in manuscript.

At last, in 1776, he retired from the office of College tutor; but he was promoted to the office of Professor of Jurisprudence, and he had taken his degree of D.C.L., which he did in 1779. On this occasion, in the University phrase, he went out grand compounder, which means that he paid the higher fees expected of a graduate. 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 had also inherited a considerable property from his father who died in 1776. It was probably the independence by which he was thus raised that determined him to resign his employment as a college tutor; but it appears that old Mr. Scott's death was his ruin, for he was stated 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 expiration of that space of time after his admission, which so curiously is called his year of silenct. 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 (Skeet, pp. 26 and 61). So early however in December, 1778, 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, Chancellor Johnstone. Dr. Scott was very popular among literary men. 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 1772. With the knowledge of Johnson he had become acquainted, and with his 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 1785 he was appointed to the office of Registrar of the Court of Faculties. In 1774, 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 Advocate-General, and knighted, and was also nominated a Privy Councillor. In 1790 he was nominated by the archbishop Master of the Faculties. Finally, 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 scrutiny in 1784, when he had been returned for Downend, he had stood in the same time returned for Glos in 1790, through the influence of ministers with the patron, the Earl of Radnor. He was again returned for Downend to the next parliament, which met in 1796. At last in March, 1801, on a vacancy occurring by the retirement...
of their age, are two of the most interesting pictures in the European collections. They were at one time attributed to Houllin, whose works they somewhat resemble; their history is well known, and their present situation is not. They are mentioned in some MS. Annals and Antiquities of Louvain discovered by M. de Bas. The pictures were preserved at Louvain until 1827. They were then sold at Christie's, 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 Golden Legend, and the event took place 1533. 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 ( widow of a dead husband), that he had attempted her honour. The count was beheaded, but immediately afterwards his widow, with her head on one arm and a red-hot iron which she holds with impurity in her other hand (an infallible proof of her husband's innocence), on her knees Suppliante 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 Stiuerbo 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 wife, the count is being led away to execution; 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 hands. They are connected by the disconsolate expression of the empress 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 represents the emperor by himself.

These pictures were fixed on the wainscoting of the Justicehall at Louvain, and by each was a panel containing an explanation of the subjects in the Flemish language, and in gold letters. They were very directly the fast approach of the decay which, 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 Dyrik Stiuerbo painted these two pictures for the Council-hall in 1468, and that he was paid for them 236 crowns. In the same MS. it is stated that Stiuerbo was on the 30th of May of the same year commanded by the city to paint 50 pictures 50 by 24 feet, another of the Last Judgement 6 feet high and wide, both for the sum of 500 crowns. What has become of these pictures we know not; they are probably preserved; but if Stiuerbo died in 1470, the last picture would have been probably never painted; the other was completed, and for many years in the Town-hall. Van Mander mentions a picture by Dirk Van Hasselt which he saw at Leyden; in the drawer was the head of Christ, and on two side-wings the heads of St. Peter and St. Paul. It was inscribed as follows in gold letters in Latin— One thousand four hundred and sixty-two years after the birth of Christ, Dirk, who was born at Hasselt, made me at Louvain. Eternal peace abide with him.' From this inscription it is evident that the Dirk of Louvain mentioned by Guidicini in his 'Description de tous les Pays-Bas,' Antwerp, is the same as Dirk Van Hasselt, though that writer mentions them as two painters. Van Mander mentions Dirk de Louvain. Stiuerbo must have resided some time at Louvain. He was also from his style probably a pupil of Jordaen. The subject of some of his school pictures prove that Stiuerbo 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 his hands are executed with less rigidity and harshness of feature. M. Nieuwenhuyys and others give 1410 and 1470 as the respective dates of Stiuerbo's birth and death, but how the information is acquired is not stated; Van Mander, who published in 1604, had also acquired this knowledge either. They appear to have originated with Otley, who makes some conjectures on the matter in his 'Early History of Engraving.'

(Passavant, Konstauire durch England und Belgien, etc., Handelshuis, Description de la Galerie des Tableaux de S. M. Le Roi des Pays-Bas, 1840.)

SUCRE, Pierre, a distinguished French painter, was born at Uccle in 1665. His father, who was also a painter, was his first instructor, but at the age of fifteen he took his brother to the Louvre, where he received a good training from 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 of the Battle of Parnassus. In 1727 he was appointed to the charge of the Academy at 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 Felice della Valli, who bore him a son distinguished as a painter, and they both for a short time afterwards elected members of the academy of St. Luke. Subleyras was patronized by the pope 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 Valen, who is seated with a flaming St. who 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 1759.

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 to a certain extent on the line, and his portraits are fine, and his heads are drawn with great care. Among the other pictures which are in the Louvre—The Breeze Serpentine at the feet of Christ, and St. Bruno restoring an infant to life. There is also an Holy Family, which is signed by him.

(D'Argenville, Abrégé de la Vie des Peintres, etc.; R. Dumenil, Peintre-Grammair Français.)

SUBULVILLA (from subulalis, an awl), is for the first time mentioned in the 'Historia de la natura et ordine Cruelium et de la tribu Subulare.' It has an oval-oblong internaly compressed pachys, with boat-shaped valves.

S. aquatica, Awl-wort, is a little aquatic starry herb, with fasciculal simple white fibrous roots. The radical leaves are linear and awl-shaped, the scapo naked and few-dowered, the pedicels filiform and bractless. It is native of the colder parts of Europe, in ditches, lakes, and rivulets with a 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, even during the time they are expanded, so that, other plants may grow to a large size 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 kept in a pot filled with sand or gravel, and then plunged in water.

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

SUCS. There is a legendary term 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 such a succession either by coming into the place of a living person, or by becoming the successor of one who was dead. Great care must be taken to avoid confusion of the terms. In living, one instance of which is the Bonorum Cessio according to the Lex Julia. Succession was again either Universal or Singular. The instances of Universal succession (per universum) are two: First, the holding by a person's heirs, getting the possession of the bona of another, buying all a man's property, adopting a person by adoptio, and admitting a woman into the manus as a wife; in all of which cases the heaer succeeds in personal possession. Secondly, possession at once to the person who was made heirs, or got the bonorum possession, or bought the whole property, or adopted another by adoption, or married the woman. An instance of singular succession is the taking of a legacy under another's will.

The term Succession 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
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 descendible lands of his ancestor as universal successor; and the executor takes the descendible lands of the intestate, and is 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 same corporate property—a corporation simply becomes members of the corporation. But it has been established in some cases (2 B. & Ad. 840) that the use of the word 'successors' implies that the legislature meant to establish a corporation; and yet it is certain that a feoffment of land to a corporation aggregate without the word 'successors' is a valid grant. In a feoffment to a corporation sole the word 'successors' is 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 role that a corporation may be established by the use of the word 'successors' in a statute is founded on an assumption, not a necessity of the word 'successors.'

SUCCESSION, WAR OF, the name usually given to the war occasioned by the succession of the Duke of Anjou, grandson of Louis XIV., to the throne of Spain. Charles II., of Spain, the brother of Louis XIV., to whom he was related without affaditt, having no issue nor brothers, the succession to the Spanish monarchy appeared to belong to Maria Theresa, Queen of France, the eldest sister of Charles, and to the children of her marriage with the Prince of Parma. The marriage was terminated by a solemn covenant her right to the throne of Spain. The second sister of Charles was married to Leopold I., Emperor of Germany, and had not made on marriage a renunciation of her right. The French, however, the Electress of Bavaria, had, previous to her marriage, been obliged to renounce her hereditary claims. The Emperor Leopold in consequence claimed the crown of Spain for his daughter. Two suits were brought, in which the latter was the principal plaintiff. The Electress of Bavaria, on the other hand, maintained that the renunciations 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 endeavored to influence Charles II. in their favor, and he was at length induced 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 general war, a treaty, called the second treaty of partition [July 24, 1700], was signed by the French, Spanish, and English, at the Hague, on the 24th of March, 1700, between France, England, and Holland, the details of which will be found in another part of this work. By this treaty the Archduke Charles, son of the Emperor Leopold, was declared to have the right of a son to the Spanish crown. In the meantime the grandson of Louis was awarded the duchy of Lorraine, 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'Harcourt, who was afterward executed as a traitor to the house of Austria, 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 probable by the prolonged and inauspicious course of his father's reign. The title of Philip V.: to his assembled court he presented him with these laconic words:—'You see before you the king of Spain. Nature has formed him for it; the deposed king has none. The death of Charles II. of Spain rendered the title of Philip V. 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 same corporate property—a corporation simply becomes members of the corporation. But it has been established in some cases (2 B. & Ad. 840) that the use of the word 'successors' implies that the legislature meant to establish a corporation; and yet it is certain that a feoffment of land to a corporation aggregate without the word 'successors' is a valid grant. In a feoffment to a corporation sole the word 'successors' is 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 role that a corporation may be established by the use of the word 'successors' is a statute is founded on an assumption, not a necessity of the word 'successors.'
heavily but unsuccessfully disputed by the Bavarians near Donauwörth. Advantage was taken of their success by the allies to offer peace on favourable terms to the elector, if he would withdraw his troops from the Rhine; but the Bavarians, Marchall Tallard with a French army of 30,000 men determined the elector upon refusing these proposals; at the same time Eugene had joined Marlborough with 20,000 men; the Prince of Orange was there with 25,000; and the Spanish force, under whose command they planned, was sent to reduce Ingoldstadt. On the 18th August a decisive engagement took place, which terminated in the complete defeat of the French and Bavarians. The details of this battle are found in the articles BLESSEM and MARLBOROUGH, P. C. This disaster was followed by the loss of Bavaria, which was occupied by the Imperialists, and the elector was compelled to retire with the French army to the frontier (11 September). [MARLBOROUGH, P. C.] The surrender of Munich and the terms of surrender were granted, and a peace was on the eve of being proclaimed when all hope of it was extinguished by a further proposition from the allies, to which it would have been disadvantageous, to the Crown Prince of Saxony, and to take up a position at Brussels. In Italy and Spain the French obtained some advantages, which however were counter-balanced 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 succeeded to the Spanish throne. The war was conducted in Aragon, Catalonia, and Valencia. Nothing however of importance occurred during the campaign of that year; the Prince Eugene was sent to Italy to recognize the army, while Marlborough and Prince of Orange entered Flanders to assist him. In 1706 fresh exertions were made by Louis to maintain an army in Germany, and to take the offensive in Savoy and Flanders. Accordingly he sent into Flanders one of the finest armies that had yet appeared in the war, and placed it under the command of Marshal Villeroi. The impudent air which this general preserved disgraced his projects; he left a strong position which he had taken up at Louvain to give thanks to God on the spot, and abandoned it, which resulted in his complete defeat. [RAMILIES, P. C.] The details of this great battle will be found in the article referred to; but the fact that it was fought almost on the site of Waterloo, by which name it has often been designated, may not perhaps be generally known. The victory at Ramilie Secured to the allies the greater part of the Spanish Netherlands, while, to increase the misfortunes of Louis, his Marshal, Marignan, lost the battle of Turin against Prince Eugene (September 7); a defeat which was followed by the loss of all territories which had been occupied by the French in Italy. [EUGENE, P. C. ] In Spain they were also repulsed in Catalonia, and the Portuguese, under Prince of Condado, entered Madrid, which city however they were unable to retain. At this juncture of affairs a suspension of hostilities was proposed by Louis to the allies, but rejected chiefly through the influence of the pensionary Antony Heinsius. In 1707 a considerable portion of the Spanish inheritance was in the possession of the Imperialists and the allies, while Lombardy and Flanders had already been secured to them by the battles of Turin and Ramilie. 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 Fitz-James, Duke of, P. C.), sent them to Catalonia in support of his grandson. On the 24th April a most decisive victory was obtained by him over the English and Portuguese under the Earl of Galway and the Marquis Los Minas at Almansa. In this important battle the Spanish sustained a loss of 17,000 killed, wounded, and taken prisoners; their two generals were withdrawn from the field severely wounded, and 120 standards fell into the hands of the French. The victory of Almansa proved the turning point of the war, which, from that time to the close of his cause, finally ensured the throne of Spain to Philip V. Aragon and Valencia were reduced to his submission by the Duke of Orleans, and in the latter end of the year 1707 the only forces which were maintained by the enemy were those in Catalonia. The following year Prince Eugene once more formed a junction of his forces with those of Marlborough, and thus united gave battle to the French army under the command of the Prince of Burgundy and Vendome at Oude-
of Marlborough of his influence; measures of peace were simultaneously taken. [Auchter] P. C. was set on foot between the Courts of England and France, which ended in a preliminary treaty of peace being signed in London on October 6, 1711. The conferences for a general peace at Utrecht were selected at the place where they were to be held.

The negotiations which took place at Utrecht in the early part of the year 1719 met with several interruptions, arising from the everlasting interests of the different powers who composed the grand alliance. The victory obtained by Marshal Villars over the Earl of Albermarle at Denain (24th July, 1719) [Villars, P. C.], and the consequent recovery of Dunkirk, was an aristocratic rule which restored the French, and rendered the allies more tractable. Peace was at length signed at Utrecht in the month of April, 1718, 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 (I. C. vol. xxv. p. 174).

The real gain by it was undoubtedly the French King, who obtained nearly all 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.

Disasters which 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 by the drudgery of Joubert's staff. In the war, proved themselves the most desirous of promoting peace. They commenced negotiations at the Castle of Raisins in November, 1718, and a treaty was there concluded on the 7th March, 1719 (Joubert, P. C.); and the terms of it were definitely agreed upon on the 7th September following at Baden in Aargau. [BADEN, TREATY OF, P. C. vol. xxv. p. 174.] The King of Spain acceded to these treaties, and England agreed to the peace.

For a more detailed account of this war, the following works may be referred to: Koch's 'Revolutions of Europe,' translated by Crichton, 5 vols., Edinburgh, 1825, vol. ii. p. 145-157; *Outlines of History;* Lorden's 'Cabinet Cyclopædia,' p. 584-590; Kohrmann's 'History of Germany,' translated by Hass, London, 1844, p. 632-647; Schlosser's 'History of Europe,' vol. iii. p. 17-84, translated by Davison, London, 1844; 'History of Spain,' Library of Useful Knowledge, London, 1833, book iii. chap. 1, 2, 3; Voltaire, 'Essai sur l'Histoire Générale,' &c., chap. 190-196; Lord Mahon, 'History of the War of Succession in Spain.'

[French: [MASSÉNA, P. C.] of Albufera and Marshal of France, was a native of Lyons, where his father was a silk manufacturer. The year of his birth is stated by some authorities to have been 1770, by others 1772. On the battle of Toulon, in 1793, he was distinguished as a lieutenant in the cavalry of the national guard of Lyons; shortly afterwards, he became captain of a volunteer company raised in the department of the Arzbehe, which he commanded during four years, and during which he procured the '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 depôt of the convention, Maingret. 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 Larue. In this campaign he specially distinguished himself at the combat of Lomont (23rd November, 1795), where he captured three Austrian standards. He afterwards served with distinction in the same campaign under the Generals Augeperse [Augeperse, P. C.], and Masséna [Masséna, P. C.], and received several wounds. He was selected by Masséna to present to Bonaparte the standards which he had captured during the year 1799 by the brigade in which he was battalion. It was on the field of battle of Neumark (2nd April, 1797) that he was raised to the rank of chef de bataigne. He afterwards joined the army in Switzerland, where he was instrumental to the conclusion of a treaty with the cantons of Berne and Berne, which stopped the advance of the French, and after rekindled in Switzerland, and in it Souchet displayed considerable skill; it was there that he first gave proof of his talents as a tactician, which afterwards raised him so high in the estimation of the French, and in which he was recognized by his chief, who deputed him to Paris to present to the Directory twenty-three standards taken from the Austrians.

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; he was, however, on account of discipline, dismissed from 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 position he made many strenuous endeavours to renew the ancient discipline and to anesthetize the condition of the soldier; these endeavors were construed by the suspicious government at Paris into an attempt to introduce in the army of Italy the principles of discipline which he had been desirous of applying to the strong remonstrances made on the subject by General Joubert, who was among 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 seconded the skilful marshals of General Masséna in the Grisons. [Masséna, P. C. S.] The successes which attended the French arms in Switzerland were counter-balanced by the disasters of General Schérer in Italy; these disasters necessitated the appointment of a more active and 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 main army, a post which he succeeded in filling to his military reputation; the careful avoidance of error in his movements and manoeuvres, the skilful disposition of his troops, whether attacking or in conjunction with the main army, as he procured him important success, soon 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 at Aix-la-Chapelle, in the battle of Cezio (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, when 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 Alessandria, 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, he enjoyed the position of a great in this campaign.
ally contributed to the success obtained by Savary, Duke of Horigo, over the Russian General Essen, who, with twenty-five thousand men, attacked the French on the banks of the river Narro (16th February, 1807), and was repelled with considerable loss.

The reputation which Suchet had acquired in these engagements, as a brave soldier and a skilful tactician, induced Napoleon to intrust him with a separate command. An opportune moment had arrived to afford him by this means a test of his abilities. Suchet had been left behind the lines in Spain in 1808, and he gave him the command of the fifth division of the army, having previously raised him to the highest grade of the Legion of Honour (Legion or Honour, P. C.), and having bestowed upon him the generous gift of 20,000 francs, with which he purchased a seat in the Imperial Court of the Empire. After assisting for a short time at the siege of Saragossa [Saragossa, P. C.; Lannac, P. C.S.], he was appointed to the important command of general-in-chief of the Spanish army in the province of Aragon. This brings 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 destitute of discipline that it almost amounted to disintegration; but he perceived that he could reform this discipline, he evinced considerable discernment, prudence, and energy; no longer thwarted in his efforts by the factions opposed to mere theoretical statesmen, was he dismayed by the time which he thought the army was necessary to Jutice and vigour. Indeed, he was specially equipped for this important purpose. Suchet, says the historian above referred to, 'was no ordinary man; and with equal vigour and unswerving determination he commenced a system of discipline in his corps, and of order in his government, that afterwards carried him, with scarcely a check, from one success to another, until he obtained the rank of marshal for himself, and the honour for the corps of being the only one in Spain that never suffered any signal defeat.' (Napier. History of the Peninsular 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 Macauquilas (8th June, 1810), and Tortosa (2nd January, 1811). These successes were followed by one still more important, the taking of the city of Tarragona (17th December, 1810), of 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. The army of the French consisted of some five thousand cannon and abundant munitions. (Tarragona, P. C.)

The sagacity of Suchet in the siege of Tarragona proved itself; 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 unserviceable, followed soon after the capture of Tarragona. These brilliant services were most appreciatively 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 [Lannac, P. C.], the fortifications of which had been reconstructed by the French after 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 in Aragon, Suchet succeeded in investing 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 entire province of which it was the capital. Although this province, which had been the scene of his last successes, became the title of the dukedom which he was made by Napoleon, who added to this title an extensive and valuable domain. But he had little time to enjoy his conquests; the Spanish stations were not at present occupied with this reflection and admiration of posteriority by the general expressed feeling of the Spaniards under his rule, that he mitigated the horrors of war by his humanity, and dealt equal justice to the conquered 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 successes of war; the mission, however, which he imposed upon himself was to augment the power of Spain, to increase the number of her vassals, and to diminish her enemies. (Translated from Le Journal de la Méditerranée, 7th January, 1826.) Marshal Suchet pursued the same system of government in the province of Valencia that had answered so well in Aragon; he placed in the hands of a corps composed of enlightened and respectable men. He called together an assembly of persons of every class of society, and who represented various interests, to vote the expressions of the will of the people on the war and peace of the province, and the arrangement of the public finances. He induced 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 Vitoria, compelled 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. Ordered 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 with such skill, that the movements rarely found unexpected on such an operation. On reaching Narbonne, 14th April, 1814, his adherence to the decrees of the senate directed against Napoleon. Employed to receive Ferdinand VII. of Spain, 5th P. C., he was released from Valencia, 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 towards the administration of this marshal will be further evinced by the general testimony which was borne to his justice and humanity, when, in 1823, the French again occupied the scene of his exploits. The correct view taken by Suchet, with respect to the return of Ferdinand, will be seen by reference to Monholon, History of the Captivity of Napoleon, vol. ii. p. 350.

The speedy adherence of Suchet to the Bourbon 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 Strasburg. On the return of Napoleon from Elba, though he unmitigated his fidelity to the Bourbon, at a long council in 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 the Austrians, and the capture of forty thousand men, and on the approach of the main body of the Austrians, nearly one hundred thousand strong, he was compelled to fall back upon Lyon, for which city, by his judicious management, he obtained the title of Marshal. Such was the condition in it being that all the valuable mentions 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 restored to his position in the peacetime by a royal ordinance, dated the 6th of March, 1819. 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 adviser, but he was already suffering severely from the disease to which he shortly afterwards fell a victim. He died at Madrid, 1829. His widow, the Marchioness giving behind him a young widow and several children. During the latter years of his life he was occupied in composing a memoir of his campaign in Spain, which has since been published. (Milnor, Historical Dictionary of the French Revolution, vol. ii. p. 71.)
S U R

The reputation of Susaet stands deservedly high amongst the generals of Napoleon. His military career was sustained by many of the excursions which have disgraced so many of his most distinguished colleagues in command. Brought up in the household of M. de Tarragon, a rich and influential member of the nation, Napoleon was committed by 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 melancholy occasions is a melancholy fact which the history of all ages has established. They have already dwelt upon his qualities as a military and a civil ruler.

The high opinion entertained of Susaet by Napoleon has been almost universally subscribed to. Louis Carbon, the questioner being asked him by the former, who, in his opinion, was the first of his generals? he replied, 'I think that Susaet is probably the first. Masona was; but you may say that he is dead' (1817), alluding to the complaint under which that man was fast sinking. On another occasion, at St. Hilaire, Napoleon remarked, 'that if he had had two such field-marshals as Susaet 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.' (Court and Camp of Bonaparte, p. 410.)

SULPHUR, 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 alkali, strewn 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 escape of the fumes. The windows are opened to let them escape and to dry the alkali. In winter, after the smell of the sulphurous vapour has ceased, the windows are shut, and charcoal is burnt in the chamber, in order to dry the alkali. By this process, 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.]

SURGEONS, COLLEGE OF. [Surgeons, College of, or, P. C. S.]

A 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 college shall be fellows thereof, 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 appoint in manner by the charter authorized, shall be fellows of the said college. But no person, except as hereinbefore named, is to become a fellow unless he shall have attained the age of twenty-five years, and conformed 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 examiners of the said college. Every person admitted as a fellow, as he is 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 shall hold any office or be eligible to any office of the College. There are also 10 (some other restrictions as to eligibility as the present members of the council are to continue life members as herebefore, and the number of members of council is to be increased from twenty-one to twenty-four, members of the council are to be elective, and to be elected periodically, in the manner prescribed by the charter (12) when the number of elective members of the council shall be completed and made up to twenty-four. Three members shall go out annually, but they may be re-elected immediately. The members of council are to be elected by the fellows, including the members of the council as such, in the manner prescribed by the charter (15); and the election is to be by ballot (17). There are various special provisions as to the eligibility of fellows, for which we refer to the charter. There are to be ten examiners of surgeons for the college, and the present examiners are to continue the office for an indefinite time, and all future examiners shall be 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 provides the powers of the college and the council, except as far as they are altered by the charter; and it declares that no by-law or ordinance hereafter be made by the council that shall be any force until the same 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). For the examination of candidates for the fellowship (sect. 1), for the admission of candidates for the fellowship (2), admission of fellows (5), 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 subject of examination for the fellowship are Anatomy and Physiological 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 latter part 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 yearly, or, if the candidate desire it, in writing. The questions 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, 1845), the receipts of the College for the previous year were as follows:

\[
\begin{align*}
\text{Court of examiners: fees for diplomas, &c.} & = 2,500,000 \\
\text{20 guineas each, exclusive of stamps} & = 4,092,110 \\
\text{Rent} & = 12,10 \\
\text{Incidental sale of lists, catalogues, &c.} & = 100,66 \\
\text{Expenses on the investments in government securities, &c.} & = 1,400,04 \\
\end{align*}
\]

\[\text{Total receipts:} \quad 21,765,710\]
And the disbursements were as follows:—

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>College department, including council, art, &amp;c.</td>
<td>£ 7,402 19 1</td>
</tr>
<tr>
<td>Museum department, including catalogues, specimens, spirits, salaries, &amp;c.</td>
<td>£ 3,663 0 10</td>
</tr>
<tr>
<td>Library department, including the purchases and bindings, books, salaries, &amp;c.</td>
<td>£ 1,120 12 7</td>
</tr>
<tr>
<td>Miscellaneous expenses, taxes, rent, &amp;c.</td>
<td>£ 698 18 1</td>
</tr>
<tr>
<td>Repairs and alterations</td>
<td>£ 223 10 6</td>
</tr>
<tr>
<td>Hunterian lectures, &amp;c.</td>
<td>£ 264 4 0</td>
</tr>
</tbody>
</table>

**Sussex, Augustus Frederic, Duke of.** A Prince of the United Kingdom, the sixth son of George III., was born on 15th January, 1773. After spending some time under a private tutor, he travelled abroad, and studied at Göttingen. From an incident connected with his early history, a very curious question regarding the law of marriage and legitimacy arose. In April, 1798, he was privately married at Rome to the Lady Augusta Murray, daughter of the Earl of Dummore. Independently of other questions, it was thought that there might be an objection to the validity of this marriage on the ground that its being celebrated by a Protestant clergyman in a place where by the law of the state a marriage by such a person is invalid, and where there was no British representative of the Anglican Church. Accordingly the ceremony was repeated in St. George's, Hanover Square, London, on 5th December, 1798. The ground for questioning the validity of their union was the Royal Marriage Act of Geo. III. c. 13, which prohibits every descendant of George III. from contracting matrimony without the consent of the crown, and provides that every marriage contracted without this consent being first obtained, shall be null and void to all intents and purposes what-so-ever. There is no doubt that, so far as respected England, the English marriage came under this act. But there were reasons for supposing that the marriage at Rome might be capable of being declared valid in other parts of the kingdom, of which the Duke, as a prince of the blood, was as much a citizen as he was of England. With regard to Scotland, the statute was so much connected with the English Marriage Act, that it is questioned if it extends to that part of the kingdom; and as to Ireland, that country was not united to England when the act passed. It was supposed that the question might come to be considered in relation to the succession of the throne of Hanover, but the birth of a nearer heir has rendered such an event unlikely. His first wife having died in 1834, he married in 1840 the widow of Sir George Buggin, without conforming with the Marriage Act. On 20th November, 1830, he became President, after a pretty warm contest, of the Royal Society, but he resigned this office before his death. He was a great friend of literature and art, and a warm supporter of every liberal measure in politics. He was of a popular, easy disposition, and he was a great collector of rare books, and left behind him a magnificent library. It consisted in 1827 of 50,000 volumes, 14,000 of which were theological. He died at Kennington Palace on 21st April, 1849, and was buried in Kensal Green Cemetery.

(Biographical Dictionary of the Society for the Diffusion of Useful Knowledge.)

**Sustermans, Justus,** a distinguished Flemish painter, was born at Antwerp in 1597. He was the pupil of William de Vos. He is little known in Flanders; he lived chiefly in Florence, where he was appointed his court painter by the Grand-Duke Cosmo II. He was favoured also by Ferdinand II., whose portrait he painted, and who ennobled him. His master-piece is a large picture of the Florentine nobility wearing allegiance to Ferdinand upon his succession. He died in 1681. There are several portraits of him in the Pitti Palace at Florence. Rubens is said to have pronounced Sustermans an honour to his country.

(_Descamps, La Vie de Peintres Flamands, &c._; Lanz, _Storia P. D._, &c._)

**SWIFTEST PROPAGATION, PRINCIPLE OF, in the undulatory theory of light, is the expression of the fact that the front of a wave, after reflection or refraction, passes through a given space in the least possible time; the velocity after refraction being the same as before, and after refraction being that which depends on the medium in which it waves.

In the article "Undulatory Theory, P. C.," the equality of the angles of incidence and refraction was proved only for the case in which the reflecting surface is a plane; but it is easy to prove that the equality subsists whatever be the form of the reflecting surface. Let $N Q S$ be a section through the axis of a reflecting surface, and $\therefore$ the radiant point be infinitely remote, let $MN, PQ, RS$ be rays of right, or lines parallel to the direction of the incident wave; or, if the radiant point be at a finite distance, let these lines diverge from such point so that in either case they may be perpendicular to the general front of the wave: also let that front have the position $nS$ at a certain time if the reflecting surface be not interposed. Then $N, Q, S$ being the centres of the partial waves produced by reflection, let the curve at $n'$ be part of the surface of the wave originating at $N$; its radius $Nn'$ being equal to $Nn$, since the velocity before and after reflection is the same; and let the curve at $q'$ be the surface of the wave originating at $Q$, so that $Qq' = Qq$. Imagine partial waves to be formed in like manner from every point in the curve surface $N Q S$; then a curve surface touching all the spheres, as at $n$ and $q'$, will be the general surface of the reflected wave, at the time that the surface of the direct wave would have been at $nS$. Next, imagine $Q$ to be very near $N$, and let fall $Qq$, $Qq'$, perpendicular respectively to $Nn$ and $Nn'$; then $Nn'$ may be considered as the difference between $Nn$ and $Qq'$, and $Nn'$ as the difference between $Nn$ and $Qq$; therefore these differences are equal to one another; hence, $N Q$ being considered as part of a straight line touching the curve $N Q S$ at $N$, the angle $QnN'$ is equal to $QnN$ or $MNT$; consequently the angle of refraction (the complement of $QnN$) is equal to the complement of $MNT$, or the angle of incidence.

Again, in the article "Undulatory Theory, P. C.," it is proved that, when light is refracted at a plane surface, the sine of the angle of incidence is to the sine of the angle of refraction in a constant ratio, which is that of the velocities of the waves previously and subsequently to the moment of incidence, and the same law may be proved to hold good whatever be the form of the reflecting surface.

For let $NQ$ be a section through the axis of a transparent medium bounded by a curve surface, and let $MN, PQ, RS$ be rays or lines perpendicular to the surface of a general wave; also let $S_1 q_1$ represent the position of that surface at a certain time if the refracting medium be not interposed. Next, $N, Q, S$ being the centres of refracted waves, let $Qn$ be the surface of such waves at the same time, and imagine half waves to be formed in like manner from every point in the curve surface $N Q S$; then a curve surface represented by $S_1 q_1$ touching all those spherical surfaces will be the general surface of the refracted wave.

Now $I$ and $R$ representing the velocities of the incident and refracted waves respectively, by the principles of the undulatory theory we shall have

$$ I : R :: Nn : Nn' = \left( \frac{R}{T} \right) $$

and

$$ I : R :: Qq' = \left( \frac{R}{Qq'} \right) $$

Fig. 1.
S W I

Next, imagining Q to be very near N, let fall QP perpendicularly on Nn, and Qr perpendicularly on Nr; then:

\[ \frac{Nn}{Qr} = \frac{Nt}{Qr} \]

and, substituting the values of Nn and Qt,

\[ Nt \times Qr = Nn \times Qr \]

therefore

\[ Nn : Nt : Qr : Qr \]

Now NQ being considered as a straight line, it is a common hypotenuse to the right-angled triangles NQn and NQt; hence

\[ Nv : Nt : sin. NQn : sin. NQt \]

But ZQ and Zn being perpendicularly to the refracting surface, NQn is the complement of PQN, and is therefore equal to the angle NnQ. Qr is the complement of QnN, and is therefore equal to the angle (ZnN) of refraction at N—thus

\[ Nn : Nt : sin. of incidence : sin. of refraction ; and it follows that \]

\[ Nn : Nt \]

or, since by the principles of the undulatory theory, the ratio of \( P \) to \( R \) is constant in the same medium, the sine of incidence bears a constant ratio to the sine of refraction.

It may now be shown that a wave is propagated from the distant point to any other point in the line of its direction, subsequently to reflection or refraction, in the least possible time.

Assuming, with respect to refraction, if the waves diverging from N and Q (Fig. 1) with velocities equal to that of the incident waves to take any other directions than those of Nn and Qt, which are perpendicular to the front Sfgr of the general wave, it is evident that they must be reflected through S and touching the surfaces of the several waves would fall between Snw and SN: such surface would then be the front of the refracted wave; and thus the front would, in a given time, have passed through a less interval from the reflecting surface (or from the distant point) than it actually passes through in consequence of the partial waves taking the directions Nn and Qt.

In like manner with respect to refraction: if the waves diverging from N and Q, with velocities which bear to the velocities before refraction the ratio of R to \( P \) to I were to take any other directions than those of Nn and Qt, it is evident that a curve surface passing through S and touching the surfaces of the several waves would fall between Snw 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 distant point, or from the reflecting or refracting surface, during which the general wave arrives in any given position, as Srfg, will be the least possible.

William of Malmesbury, the 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 Helman, Bishop of Winchester, and was soon after appointed by the same prelate to be his chaplain. In the reign of the latter he became chancellor, and was intrusted with the education of Alfred, whom he accompanied to Rome. [ALFRED, P. C.] The services rendered by Swin will be bestowed on the cathedral church of Winchester, and the affairs of his kingdom were rewarded by his elevation in 852 to the see of Winchester, vacant by the death of Helman. He is supposed to have been the originator of the payment of ‘Peter-pence’ to Rome, though there is much reason to believe that this tribute had an earlier origin [PETER-PENCE, P. C.], and also to have procured the first act of the Witenagemot for enforcing the universal payment of tithes.

Poulett Thomson, Lord, was the son of John Poulett Thomson, Esq., of Waverley Abbey and Rochampton 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 Poulett by sign-manual, in 1820, in memory of his mother, married, in 1781, Charlotte, daughter of Dr. Jacob of Felsham, and by her he had a family of nine children, of whom the subject of the present notice, born at Waverley on the 13th of September, 1799, was the youngest. There were two elder sons, Andrew and George, of whom the latter, now George Poulett Scrope, Esq., is the present master of Stroud, and the author of ‘Principles of Political Economy,’ 12mo., 1833, and of ‘The Life of Lord Sydenham,’ 8vo., 1843.

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 1803, having been born in the early part of the reign of Mr. Pitt, is not quite correct in all respects; for Mr. Pitt was not then prime minister, as assumed, and could not have been in attendance upon the king in that capacity. It seems unlikely indeed that a child could have been associated with the prime minister, from his native county, at the age of sixteen, to be placed in his father’s house of business at St. Petersberg, then under the direction of Mr. Pitt himself, who was a man of much more serious stamp.

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. Petersberg, thus under the direction of Mr. Pitt himself. 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. Petersberg, this time as a partner in the firm; and here he remained for two years. The greater part of the winter and spring of 1823-4 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.

Sydenham, 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. Hume, Dr. Bowling, and Mr. McCulloch, and he 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; steadily with the expenses of the Opposition, he spoke lest gendy, and almost exclusively upon commercial questions. On the first occasion however on which he delivered himself at any length, in a debate on the state of corn, in the House of Commons on May 22nd, 1827, he made a very favourable impression on the House, and had the gratification of being warmly complimented.

Saint Swithin’s day, ye gods, do me nae.
For forty days it will remain;

Swithin’s day, ye gods, do me nae.
For forty days tae rain use ma.</doc>
by Mr. Huskisson. 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 Post 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 dissolution 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 reestablishment of the ministry in June, 1832, on the accession to the succession 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 the 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 misprint of the date in Mr. P. Scrope's narrative, it had been in contemptuation to remove him to the House of Lords, in order to relieve him from the fatigues of the long night sittings in the Commons, under which his health was already beginning to break down; but circumstances, it is said, for a time put a stop to this plan. At last, towards the close of the session of 1839, on the elevation of Mr. Stanhope Rice to the peerage, he was offered his choice between the chancellorship of the exchequer or the government office for Canada; and accepted the latter. He was sworn into his new office before the Privy Council on the 29th of August; he attended the first session of the year, the 15th of September, and the Lord Lieutenant of 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. Murchison, the civil secretary. In August, 1840, the government 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 the misfortune to be thrown from his horse, which stumbled and fell upon him, and to sustain a fracture of the principal bone of his right leg, beside other serious injuries; and his death followed on Sunday the 19th of the same month. The most remarkable quality that Lord Sydenham possessed was that 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 partisan. (Memoir, by G. Poulett Scrope, Esq., M.P.)

SYLVESTER, JOSHUA, was born in 1693. He appears to have been of considerable patronage, and was a member of the company of merchant-adventurers at Stade, for whose secretarieship he was a candidate in 1597, recommended by the Earl of Essex. He seems to have always remained a poor man, and spent much of his time in courting the acquaintance of the rich. In the latter part of his life he emigrated to Holland, and died at Middelburg in 1698. Both in his opinions and in his choice of friends he was a most exquisite parodist; and those numerous versified works, chiefly translations from the ancient, on which he exerted his literary reputation, show a warmy devotion 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 title of one of his original poems, which is thus entitled: "Tobacco battered, and the Pipes shattered (about the Earl that idly idolize so base and barbarous a Weed, or at leastwise as I love so 'batch grass') (Old Vanities), by a Volley of holy Shot thundered from Mount Helicon." He is chiefly known now on account of the obligations said to have been incurred by Mr. P., to his patronage, translation, that of the 'Divine Weeks and Works' of Du Bartas. (Bartas, Du, P. C.) There are two collected editions of Sylvester's works, both in folio, and commencing with the translation of Du Bartas. Their dates are 1633 and 1641. The second of them contains a supplement of posthumous poems; among which is that tasteless alteration of the 'Souls Errand,' which caused this fine poem to be erroneous of its author. SYMPHISOMETER (from symphisein, compression, and measure), is an instrument which was invented by Adie, of Edinburgh, in 1819, to serve as a barometer, for the pressure of the gas in the atmosphere, or of exhibiting the variations of its density near the earth. In 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, which is bored internally: at the upper extremity is a cylindrical vessel A half an inch in diameter, internally and two or three inches long; and the lower part of the tube contains, as in the gasometer, the instrument is quite filled with a vessel C of an oval form horizontally. The vessel A and the upper part of the tube B are filled with an elastic gas, either oxygen, the extremity b of the tube contains, another vessel C of an oval form horizontally. The vessel A and the upper part of the tube B are filled with a vessel C of an oval form horizontally. The vessel A and the upper part of the tube B are filled with an elastic gas, either oxygen, air, or hydrogen; and the lower part of the tube contains, which is the instrument being now brought to a vertical position, on removing the glass tube B, the gas in it will be compressed, and the pressure will rise. The instrument being afterwards returned to its former position, the vessel A will expand, and the gas in it will be expanded, and the pressure will fall. The instrument being again put in a vertical position, a counterbalance to the weight of the column of gas 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 symphismometer, the instrument, together with a good barometer and a thermometer, must be placed in a glass receiver in which, by proper syringes, the air may be rarefied or condensed at pleasure: then, on bringing the instrument to such a state as a thermometer 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 symphismometer which correspond to these, it will be seen that the distance between every two of these points being divided into one hundred equal parts, the scale p of the instrument is constructed. The particular graduation at each inch is made by the barometer, which stands at that point of the gasometer in the instrument, the numbers 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 thermometer on the scale of the symphismometer in order to obtain the true height of the mercurial column in a barometer.

But, to avoid the trouble of computing and applying this correction to the instrument, the scale p of the symphismometer 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 A while the pressure of the atmosphere on the upper surface of the oil C remains the same, so that the gas in that corresponds to 294 inches on the scale of a barometer, and observing the points at which the top of the column in B is in these positions on the scale r are numbered so as to express, in degrees, the temperature at which the gas, which is being moved till its index (at 294 inches) coincides with the degree of the scale r corresponding to the temperature of the atmosphere, expressed by the degree of a thermometer r attached to the instrument, that the graduation on p corre.
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Spending 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 Encyclopaedia,' having made a series of obser-
vations for the purpose of comparing the indications of the
symptomsphere with those of a barometer, found that the
former stood higher than the latter by quantities varying be-
 tween 0.08 inch and 0.017 inch, the temperature varying be-
tween 60° F. and 62° F. (Paragraph 4.) He found 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
symptomsphere; but the variation of the excess is not so easily
accounted for; it may, however, be supposed to be caused in
part by the expansion of the gas not being exactly propor-
tional to the increments of heat, a circumstance which is
assumed in the subdivisions of the scale $r$, between each of
the complete inches, being made equal to one another, and in
part from some absorption between the oil and the gas.

It is inferred, therefore, that the indications of the symptoms-
phere cannot always be relied on as accurate measures of the
density of the atmosphere; but, since it has been observed that
it is frequently made in 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, in these respects, it possesses great advantages as a
marine barometer in indicating the approach of gales of
wind.

SYMPLOCARPS, a genus of plants belonging to the natural
order Arecese. It has instructive spathes, a short
spathix covered with tetrandra dioecies. The ovaries are
one-celled, with one ovule in each and a minute stigma.
The berries are consolidated, the seeds without albumen.

St. fadthc, Skunkweed or Skunk-kabbage, has a large aphyte
with numerous crowded fleshy fibres. The spathes are pro-
cocious, ovate, turbid, various in width, spotted, and sometimes
covered with dull brownish purple. The spadix is oval, on a
short peduncle covered with perfect tetrandra flowers, and of
the same colour as the spathes. It has wedge-shaped
sepals, truncate at the top, and edges inflated; the stamens are
opposite the sepals with subulate filaments equal in length to
the calyx. When the spathes decay, the spadix continues to grow,
and every part of the plant, except the spadix, decays. Within
the spadix 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,
crowded, oblong, heart-shaped, and on long channelled
petioles. The plant emits an offensive odour; its tubers are
acid, but when dried and powdered, are aromatic.

It is considered an excellent remedy in asthma, catarrh, and
chronic coughs, and has also been employed in dropy, rheuo-
matism, and epilepsy.

(‘Linley, Flora Mexicana.’)

SYNABATHOCRINUS, a genus of fossil Conioidea from
the mountain limestone of Holland forest. (Phillips.)

SYNOCHUS and SYNOCHA, forms of fever recog-
nised by most of the older and more recent writers on
the practice of medicine. Sauvages described Synochus to be a fever
which lasted more than a fortnight without materially weakening
the pulse; while Cullen used this term to express a fever
which combined the two forms of inflammatory and putrid
fever, that is, a fever which at its commencement was inflam-
matory and at its close putrid. The inflammatory form of
fever which was characterised by running its course rapidly,
and marked by high excitement of the heart and arteries, was
called Synocha by Cullen. A putrid and low form of fever was
called Typhus. The latter term is now however applied to
all continued contagious fevers, and the former terms are not
often used at all.
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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 material from the description of other writers a long time. We have 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 Astronomische 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 Barlow's tables, and in Hermann's Werk-Arithmetick, before any one else had used it) is decidedly of opinion that the 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 paper a kind of mirror, which has a bright image in one place, whereas rough paper dissipates the light equally in all directions. Second, pressure will cause the figures more much 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, even 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 if possible to surpass. We are satisfied, after many trials, to report, that a dull paper, of a whitish brown character, too thick to be seen through, and an ink which is of a dull-brown black, as it were the very deepest shade of the colour of the paper itself, are the things which render the things 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 existences too perceptible, they pronounce it ugly. Accordingly, the uglier they hold it to be the more legible the reader will pronounce it.

We regret to see that, just as we are beginning to abandon the use of the thick even-sized figures, the Germans are taking strongly to them. Most of the modern German tables have therefore illegible heads of columns and rows. The heads of the tables of multiplication, &c., 1, 2, 10, 100, 1000, 10000, &c., are perfectly illegible: they are entirely different from those in the old edition. The numerals are of the same form and size as in Plummer, but the headings and lines are different. We suspect that some writer of more recent research on the quarrers of authors, of some hunter of old injunction cases, might find something about the history of these two books.

Cader's Table, Paris, 1797, goes to 10,000 X 100; and the printed 1000 X 100 in our article.

Breitenacker, Producten-Tafel, Hamburg and Gotta, 1841, goes up to 100,000 X 100.

There is a compression of this kind: in finding, for example, the multiplication of 62878, the number in the line headed 2800, and there, in one part of the page, opposite (6) 286, he finds the first three figures, and in another part, opposite to 78, the last three figures. The first part begins at 62878, and the other parts in which the following numbers are less than 60, 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 requires attention at 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 515.

The Munch table, mentioned in our last article, is 1610, J. G. Herwart, Tabulae Arithmeticae Prostrefaherametique Universales, a folio containing all products up to a thousand thousand.

In the Royal Society's Library is a table by J. C. Jentner-wen, Neu-erfundene Multiplikationen und quadrat-Tafeln, Berlin, 1825. The earliest table we have seen mentioned (by Lipensia) is — Thomas Finck, Tabula Multiplicaciones et Divisionis, Coen, 1565 (in this form). There is also, by the same author, Tabulae quotidianum usum accommodatae, Copenhagen, 1615, 16mo.

As Finck is an author of some interest in the history of tables (as will presently appear), we have some inquiry about these works, and we find that they are not in the library at Copenhagen; but that Muller's Cambria Litterata, vol. ii. p. 254 gives them as follows. It seems they were not intended for scientific purposes.

' Tabula Multiplications et Divisionis, seuematam Monetan Danice accommodatae, Hafnia, 1604; fol. ohb. ' ' Tabelliner, indrettet til daglig foroenen Regning,' Copenhagen, 1615, 8vo.

Under this head we ought to mention John Bernoulli (the younger), Sexcentenary Table, London, 1779, and Michael Taylor's Sexagenary Table, London, 1780, intended to assist the beginner in the use of logarithmic calculations. The former having 10° for the first term, and the latter 1°. Both were published by the Admiralty.

§ 2. Tables of division and of prime numbers. —Cherruc's table gives not merely the lowest divisor as stated, but every divisor, for all the numbers under 102000 which are not divisible by 2, 3, or 5. It is accordingly a larger (and we think a more useful) work than that of Borkhardt.

Branker's translation of Rhoenis, 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 is preserved in several places the title of a work of Pell which we have never seen, and which we take from Lipensia: Tabula decem millium difficilium Numerorum, sive nempe omnem quin ad 0 ad centum Milliones [milli or logistic logarithms, the numerator being 10^10 for the first term, and 101° for the latter]. Both were published by the Admiralty.
second volume of Harris's 'Lexicon Technicum,' London, 1710.

Murdoch mentions the first part of a table (by A. Felkel) of the squares of odd numbers, all of which are given by 2, 3, 5, 6, from 1 to a hundred million, Vienna, 1776. We presume if this work had got as far as either Burkhart or Chenua, we should have heard of it.

II. To 3 squares, cubes, square roots, cube roots, and powers in general.—Perhaps the oldest printed table of squares is that in p. 30 of Pacioli's Summa, &c. [VITCA, P. C., p. 818; printed in 1494 and again in 1525, which however goes but to 9,000.] Henckius, Arithmetica, has an one which is claimed to be perfect. Augsburg, 1609, begins with squares and cubes of all numbers up to 360. Heilbronner (p. 627) mentions a tabula Ciboriana which gives squares up to 1000. Detached tables of powers are given in John Harold's Logarithmic, of which the seventh edition bears London, 1745, has all the powers of 2, up to the 144th, for the purpose of solving questions about chessboards and hornbowels. We have also the title G. C. Palmers, Arithmetrica, Erfurt, 1827.

Masers, at the end of the tracts on Combinations, London, 1795, has reprinted Hutton's square roots of (1)100 to ten decimals, and reciprocals to seven. We believe that Hutton first gave this table, which is printed in a separate leaflet, 4 vols. London, 1775, 1780, 1785. In Jonas Moore's Arithmetic, 1580, there are the squares and cubes of all numbers up to 1000, the fourth powers up to 800, and the fifth and sixth up to 200. These were reprinted in the edition of 1600.

Rogg mentions 'Art gastos nen-enterdekte,' &c. Dossau, 1755, 8vo., containing the cubes of all numbers up to 100,000, or at least professing to 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 seen almost the same thing, stating, not the extent of the table, as it ought to do, but the extent to which operations of interpolation will be effective.

§4. Pure Decimal Operations.—An anonymous work, 'The art of long and the eleavy,' Augsburg, 1526, 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 (not as having seen it) W. F. Wucherer, 'Beyträge zum allgemeinen Gebrauch der Dezimalbrüche,' &c. Karlsruhe, 1755, 8vo.

The oldest table we have found printed in English is in "This book sheweth the measure of numans or any figure of maner of hand, as well of woodde, as of lande in the field, and comtynge the true number of acres of the same. Newly invented and compiled by Sir Rycharde Benoyn Chancel of Moray, in London. Printer to the late Thomas his hospital by me James Nicolson.' There is no date, but Nicolson's dated works run from 1536 to 1538. There is another edition (which omits the table) printed by Thomas Roycroft, 1539, but we have not seen it. There are 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.

As a matter of Table I. The following is 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 what we are obliged to take from other sources, by 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 only concerned with the former; and it is sometimes difficult to distinguish between the two.

That ALBATORIUS [P. C. S.] had substantiated sines for Ptolomæus's chords,—that he had also used versed sines and tangents, and of the tables of their arcs which he compiled and issued (in manuscript at least) tables of sines to two or three decimal places, 60,000, 10,000, and 10,000,000, are historical facts of notoriety. Our question is, what tables were first printed? On the book which Regiomontanus actually printed, out of his long lists of those which he published and intended to publish (as set forth in his own 'Index Operum, &c.' printed at Nürnberg by himself, his heirs, Doppelmayer, Do Cunph et Murr, Vienne, 1560), there are either not words, or 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 'Tabulae Directionum Profectionumque' of Regiomontanus were published by himself at Nürnberg (without date, probably about 1475), and were reprinted at Venice in 1485. But we cannot ascertain that either of these contained tables of sines. But Hall (Repart. Bibilogr.), who gives their titles, gives that of the next edition (Augsburg, Ehr. Randolf, 1490, 4to.) in a fuller manner: from which it appears that there is appended to it a table of cosines and tangents, in minutes, in which Regiomontanus states that Regiomontanus had not given such a table in the former edition: they are, 'Tabella Sinna recti: per gradus et singula minuta divis.' Ad Tabulae Directionum Mag. Joh. de Regiopontano redactae, Augsburg, 1503, 4to. But from the description it appears that this table does not belong to the work, since it follows even the printer's insignia. And Hall also met with it as a separate work; being, as appears from his description of the lines, pages, &c., absolutely the same as that which was appended to the Tabulae Profectionum. 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, in 4to., printed at Venice or Bologna, 1558, 12mo., and we suspect that these tables were to a radius of 600,000, as in that edition, which is of Venice, 1504, 4to. In it we find a minute-table of sines, headed 'Incept tabella sinum recti,' and with a column containing differences for multiplying.

Delambre and others mention Regiomontanus as having given the first tables of sines in this work under the name of tabula facunda. It is in the edition of 1546, and was reprinted by C. P. C., in the 'Institutiones Geographica,' Antwerp, 1545. 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 Gau- seius, in 1558, which contains the tables printed, in 4to, of the radius 100,000, and gives the minute-tables of cotangents, not of tangents. We have seen a copy of the tables of sines and tangents, 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 'Institutiones Geographica,' &c. Ingolstadt, 1533, 4to. They are minute-tables to a radius of 100,000, and were reprinted the next year in the same author's 'Instrumentum primi Mobilia,' Nürnberg, 1534, 4to. 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 by his own table which he knew to exist already. The statement that the work of Regiomontanus on triangles (Nürnberg, 1533, 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 [Tabulas, P. C.,] we will point out how we were misled. Lalande (Bull. Astron.) says that the first edition of the work, Basle, 1538, has in the title-page 'una cum tabula sinesis.' Now the content of the title-page is that Apian had only printed 'un tabula sinesis' (Basle, no date, known to be of 1561), which does contain tables of sines, took the liberty of presuming that the first edition was the same in contents, title, and place; in all of which he was most certainly mistaken. In 1642, Rheticus, the most laborious of all the table computers, made his first appearance as the editor of a work of Copernicus: 'De Laticibus et Angulis Triangulorum,' &c., Wittenberg, 4to. (Weigler and Kastner.) 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 first such publication, the work of Copernicus (Copernici Commentariolus, P. C.), is an abridgment of the manuscript, going only to every ten minutes, and to a radius of 100,000.

In 1541 appeared one of the tables which have obtained most fame. This was Adriaan van Roomen's, and these tables contain propositions Potensic de Sinibus et Chordis, in tabula composita Tabulorum Sinuum per Joan. de Regiomontano. Adjectae sunt Tabulae Sinuum duplissimae per eundem Regiomontanum, Nuremberg, 1541, folio (Kastner, 111). 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.

In 1548, in pursing the route of analogy, which suggested to him the formation of a table giving all 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, and of the modern sines, that he has the perpendicular and the base to a hypotenuse of ten millions; in that of the tangent and secant he has the perpendicular and hypotenuse as 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, of which we shall presently speak.

In 1548 Erasmus Reinhold (who had been the colleague of Rheticus in teaching mathematics at Wittensberg) published the 'Liber Tabulorum Directionum,' Tbingen, 4to. In this work, for the first time, occurs a canon facunda (not yet a table of tangents) carried to every minute. Both sines and tangents are given accurate to 104 places in the minutes.

This work of Reinhold, though founded upon Regiomontanus, must not be confounded with his professor's edition of the 'Tabulae Directionium' of Regiomontanus himself, which had tangents only to the first degree of the quadrant and which the last edition being in 1606. (We have not thought it worth while to catalogue reprints.)

In 1552 (Delambre) Maurolycus published his edition of Theodosius, Menelaus, etc. (Meuseni, 4to.), containing the three tables, that of sines, the tabula facunda, and the tabula beneficia (as he called the present table of secants). This table goes only to degrees (except that tangents and secants are given for 15, 30, 45, 60, and 69 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 secants which were published, and they accordingly attribute the invention 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 1562 a pupil of Rheticus published a table of sines to every minute, and to a radius of ten millions. This was Samuel Eisenmenger (or Siderecrassus, as he wrote himself), in his 'Libellus Geographicus,' Tbingen, 4to. And there

Reinhold taught too higher branches, and Rheticus the lower.

It is very difficult to state whether the advantage (or its absence) after-mentioned (and afterwards named) caused the writings of Rheticus to fall, that Weidler, himself a brilliant worker in the field of writing and printing of His- tory of Astronomy, there giving minutely the dates of Rheticus's degrees from the second to the third minute, and set the table as in the time when he and Reinholt were colleagues; it had always been customary to have two teachers of mathematics—i.e. Hil- ler and Maurolycus as the works of Rheticus, and in particular having nothing of the publication of 1561, of which we may therefore be pretty sure there 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 Wittenfeld, 'Conformatio Horologiorum,' in which the first edition is said to be of Heidelberg, 1576, 4to.

The first complete canon to every minute (that of Rheticus in 1561 being to every ten minutes) was Vieta's 'Canon Mathematiorum, &c. de Triangulis, eundem Adscribendo,' Paris, 1579, folio. We have described this work in TAB, p. 516, 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-page of that which Delambre examined the motto was et die quoque quiesce, which certainly belongs in either of the three seen by us. The work has well obeyed the direction given: it has lasted in silence, having never been re-embarked in catalogues or histories till modern times. Copies seem to have been rare in Germany; neither Weidler, Heiblondon, nor Kastner mentions it. Hutten never saw but his own copy. Montucla (in France!) never saw more than one in the royal library, and one sold at the Sou- bise sale (but it is not in the catalogue of that sale), which the historian would fain have bought, had not a curious bid too high. And this was only by the time Montucla's second edition was written, for by the mention of it made in the first edition it is clear that the master had never seen it. We have ex- amined in London at least eight copies. We have mentioned [VIETA, P. C.] the complaints which the author had to make against the print, and Montucla states that he bought in as many as he could. There were several details which were having taken place in the printing: and the following is worth mention:—To one of the copies we have seen (as well as to one of those of the 'lecture' edition) is appended a sheet, in correction of a case of error in the sheet of the collection of formulæ: this is a separate publication, with the date (1579) and printer's name on it.

Vieta imitates Rheticus in his method of writing the tables, but in addition uses the sine axis 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 Raphaeli (as he calls them); it is not the name that has been the cause of the modern table. He has published, in a later work, the Responsa, etc. [VIETA, P. C., p. 516], published in 1568, he names and objects to the words tangent and secant, which by that time he had seen. And he proposes to call the tangents proponit et aminea, and the secants transmutans 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 Rheticus by Pitiscus. On the additions made by Vieta to the theory of trigonometry, it is certain they do not affect it, though they may simply say that they made the computation of a trigono- metrical canon a much easier thing than it had therefore become. Delambre is quite right when he observes that the 'Tangenti et secanti canon' have no beneficial relation to the last which relates to the non-logarithmic part of it. Had he known 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 exxogis, to which we have referred in EVOLUTION AND EVOLUTION, P. C. S., p. 104. And as, by Cellibrand's account, we trace the com- mencement of Briggs's labours shortly after the time when Vieta first published this exxogis, it is by no means an un- likely conclusion that his labor of extraction and comparison given by this mode of solving equations, first put it into his head to construct the table.

Purbach and Regiomontanus had seen the advantages of adopting decimal notation, and their 'Durchgang,' and the radius, 4to. etc. was a remnant of sexagesimalism. It was reserved for Maurice Breslau to show himself a century behind his time, by publishing in his 'Metrices Astronomicse Libri Quatuor,' Paris, 1581, folio, seven tables, that of tangents, and secants, or as he calls them, sines, adscriptae, and hypotenusae. Thus, the radius being 60°, the sine of 5° 20' is given as 50° 30' 34'; and the adscript and hy- potenusae as 1 cos 35° 46' 56". Acuttedomus as we are to look upon sex- agesimal division as sacred to angular and lunar measure, we are apt to forget that the time was when such subdivisions were rarely used in Europe.
As yet do not find the modern names of tangent and secant. These were introduced in 1589 by a young man of the name of François Viète in De aequationibus... His work is well known, his in his 'Geometria Rotundi Liber XIV.' Basle, 1640. His part in the matter was quite forgotten, and has been recently revived (see Philos. Trans., May, 1645). He introduces the name of tangent, which he properly enough, as well as the names of cotangent, secant, and cosecant. He observes that these terms are foreign to him, but new and useful, and not without some reason. It is said to be sometimes of note in some calculations which are supposed to be the collection of the editor. Besides, Snell, the respected editor, was only seventeen years old when the work was published.

The tables of sines, tangents, and secants, which were introduced in his work, were afterwards made in a radius of 10 millions. 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

\[ \tan(\theta) = \tan(\frac{45\theta}{2}) \]

In 1556 Clavius published at Rome, in quarto, his edition of the 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 of the sines and tangents, as well as those of the secants and cosecants, were not used by him; but they were Protestants, and Clavius was a Jesuit, high in favour at Rome. Delambre expresses his astonishment that Clavius, in recapitulating the names of celebrated writers on dialling, should have omitted the name of Christian Rahn, as if the fact was, that the Munster followed Luther. We are not quite certain that a greater than Clavius was altogether exempt from this laughable weakness. When Vieta suppresses the names of his author's works, as those who copied them merely rhodiused, we may almost suspect that he wanted to avoid speaking of Rhetius and Reinhold; for he was very intolerant.

In 1591, Philip Lansberg published 'Triangulorum Geometria Nova.' Leyden, 1600. In 1592 Magini published 'De Planis Triangula Liber Unicus.' Venice, 4to. Both these are copied from Clavius: but Magini at least, who goes beyond Clavius in historical reference, wholly supersedes 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 Snel* 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 after 1598, since Vieta's names for the tangent and secant do not appear in Snel's work; and after, for Vieta's own works were of very slow travel. We ourselves believe fully that the Cosmographia, which contains the tables, was never published until it appeared in what is called Stevinus' Opera, at Leyden, 1610. These tables refer to every minute, to a radius of 10 millions, and they are copies of Finck, Clavius, &c. We are informed that recent researches in Belgium 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 Vosius.

In 1588, Nie Raymar, Unea Didiwmus, published 'Fundamentum Astronomiae, id est nova Doctis Sinum,'&c, Strasburg. We cannot make out from the descriptions, whether this work contains tables or not: probably it did.

The published the first English trigonometrical table is a point which we have never seen 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 Recorde, nor in the English works of either Digges, father or son, nor in those of John Dee; nor indeed in any work written in English before Blundeville, except that of Burroughs presently cited. In the 'Ale, seu, Soluta Mathematica' of Thomas Digges, London, 1573, 4to., trigonometrical tables are given for which a reversion

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* It can be made very obvious that Stevinus was alive throughout the whole of the printing of these two volumes (or five volumes bound in two). In the very Gates of London (where excepted), the author assumes himself not to be fitting any annotation amongst the Commendatore and not made up for the commen of the printer, and the printer could not wait. And thence it often happens that there is a very small proportion of the subjects which are supposed to be the collection of the editor. Besides, Snell, the re-
to a radius of 100,000. Peculiar to this table is a heading by which the sine, tangent, secant of the complement, or defect from 90°, are also made to belong to the excess above 90°; the tangents, secants, and secant of 90° are made to be those of 100°.

The history of the rest of the works of Rheticus was, till recently, very inaccurately told, and there is still some confusion about it. After Rheticus had published his two-minute canon, already noticed, in 1651, he was occupied till his death in 1676, in what is, beyond a doubt, the most laborious work of calculation that any one man ever undertook: a complete trigonometrical canon, composed of three trigonometric tables, namely: the tangent and secant; the tangent and cotangent of one degree, with a table of decimals, sine to every tenth second, and to fifteen decimals, with the first and last degree to every second, and tangents and secants to every minute, and to fifteen decimals. It is the thought, indeed, that this great work might have been introduced, if he had known what Vieta had done. At his death, he had finished this work, within a mere trifle: what little remained to do, was done by his pupil Valentinus Otho, and part of it was published at Neufeld in the Palatinate, 1696, in folio (sometimes bound in two volumes, from its thickness). The title of the book, which was published at the expense of the Emperor Maximilian, is "Opus Palatinum: but a translation of a Georgio Joachimo Rhetici, conceptum: L. Vechulli, Otho Principia Palatini Frederici IV. Electoris Mathematicum consument." The contents are (afterpreface) three books de Fabrica Canonii, on the construction of the canon; five books, in which Rheticus published three books on right-angled spherical triangles, and four books on right-angled spherical triangles, by the editor, Otho; three subsidiary astronomical tables called mathematicas, of nineteen places, giving the sines, tangents, tangents for every ten seconds, for a radius of 10,000 miles, or, as we should now say, to ten places of decimals; a list of errors, and, lastly, a good table of cotangents and cosecants for the first half of the quadrant, to every ten seconds as before, and to a radius of 10 millions. The appearance of the last table is merely the editor's want of judgment; it is clear that the publication of this plan was resolved on, and is much less accurate than the great table to ten places.

Within a short time after the Opus Palatinum was published, it was found that the tangent and secants towards the end of the quadrant became more and more erroneous, and at the extreme end very erroneous indeed. All persons who knew anything of trigonometry are aware that, to calculate the tangent or secant of an angle near to 90° true to any number of decimal places, requires that the cosine should be calculated to a greater number of places. Rheticus seems to have foreseen that the tangent and secant would become more and more erroneous near places than those which were published. When the defect was discovered, the advisers of the Elector Palatine, Frederick IV., to whom the work was dedicated by Otho, called a meeting of the scientists at Worms, and the manuscript of Bartholomew Piticus of Grünenberg, in Silisia, who had been his own teacher, and who was still in his service as chaplain: we suppose this means that Piticus himself, was the adviser. Piticus applied to Otho, then an old man, for the larger tables of sines which Rheticus had known to have calculated: Otho was never able to find them; but at his death they were found among his papers. Piticus accordingly made two publications; but so confused and ambiguous were the statements respecting them, that some of our readers may almost doubt the fact.

These two publications were as follows: 1.---He corrected all that part of the great table of the Opus Palatinum in which the tangents and secants were sensibly erroneous, being the first 86 pages. These he rebound, and his reprint to the 640—86, or 454 remaining pages of the great table. He then cut away all the Fabrica Canonii, the books on triangles, the Meteorographia, and the small table of cotangents, &c., and added to his own 86 pages and Otho's 454 a short description, or commentario, as he calls it. This of course gives a thin foot. But we collect from Delachaux, in his "Histoire des mathématiques," the following facts with respect to the "copy," that the 86 pages were such things as were completed copies of the Opus Palatinum, with the 86 correct pages substituted for the incorrect ones. And we presume that to these the separate title of the commentario was not appended, being printed off in the same sheet. 

Wieland, apiary of Motscho, given Heidelberg, 1844, and Landana resells them by taking Neustadie to be Latin for Heidelberg! The Neustadie here mentioned is now part of Bavaria, lat. 49° + long. 11° .

The rest of the French savans (to whom the subject was particularly interesting, on account of its connection with the Tabulae du Cadastre, then preparing) missed the date of the correction, which never appeared on the face of the book, or the commobserver. 

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 the one he was looking for. The title-page of the thin folio, without date or, on the first page, as follows: "Georgio Joachimi Rhetici magnus canon doctrine triangulorum ad decadas secundorum scilicet, et ad partes l 0000 00000. Recens emendatis a Bartholomeo Piatico Silasie. . . Additiones brevissime commonefactio de fabrica et usu magni Canonis doctrine triangulorum Georgii Joachimi Rhetici. Neuwiedi Typis Nicola Schrammii MDCCXVIII." It thus appears that the date is 1697, which no one has yet noted, except Kastner, copying an older description, apparently without any distinct separate knowledge of what he was describing. 2.---On the 16th of May, 1606, in the index to the Fabrica, he introduced the following, under a long descriptive title beginning with Thesauras Mathematici.


"The ten-minute canon (1651) which we have described, and of which the memory was almost lost, introduced the secants, completed the system, and suggested to Vieta both the extension and its form. Had Rheticus published his own large table before his death, in 1676, it might have been otherwise: but deferred publication was calculated, to twenty places of the sines of every 10th, 20th, and 30th, and 50th second in the first 35 minutes to 22 places (this last table was done by Piticus himself). Piticus died in July, 1618, very short after the publication of the separate "copy.

When we come to reflect, we find that the tables of Rheticus did not make such an epoch in the history of these things as might have been expected. The ten-minute canon (1651) which we have described, and of which the memory was almost lost, introduced the secants, completed the system, and suggested to Vieta both the extension and its form. Had Rheticus published his own large table before his death, in 1676, it might have been otherwise: but deferred publication was calculated, to twenty places of the sines of every 10th, 20th, and 30th, and 50th second in the first 35 minutes to 22 places (this last table was done by Piticus himself). Piticus died in July, 1618, very short after the publication of the separate "copy."

The copies of the works, the Opus Palatinum, and the Thesauras, which belonged to Delenin, were bought at the sale of his books by Mr. de Bourgeois. The copies of the Thesauras were corrected by them for the use of the society, to be printed at the running titles of the columns. The uncorrected copy will have, as ought to have, Basioc Differentia Hypothomatem. But the corrected copy (quo curator) (quo curator?) will have, as ought to have, Basioc Differentia Hypothomatem. 

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done. In the Berlin Memoirs for 1786, John Bernoulli (the younger) revived the knowledge of the *Opus Palatinum* and the *Thesaurus*; and several other men had previously come at some statement to the effect that Pitiscus 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 the *Opus Palatinum* into the hands of Prof. Prony, 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 *Histoire des Astronomes Modernes,* a work which had given nothing but mistakes. Hutton knew as much as Bernoulli.

Kastner (1796, who would have got much more credit if he had given a proper name to his work of bibliography, instead of calling it *Napierian Logarithms*,) has set down and given an account of all the matter, except the corrections of the *Opus Palatinum*, on which he could only quote from a periodical of 1789.

In 1696 Pitiscus 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 $\frac{1}{10}$, $\frac{1}{100}$, $\frac{1}{1000}$, etc., of the 45th. The edition of 1688, now before us, has, of course the corrected tangents and secants. It was reprinted again in 1618, and Dechales mentions a reprint, by Henrion, in 1629.

Pitiscus will always be remarkable as the priest who wished that all his brethren were mathematicians, to make them masterful 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 Schooten's *Tables Astronomicae,* published in 1638. Leibniz's paper was reprinted in 1638 (7) and we know there is an edition of 1672 at Rouen, and of 1683 at Brussel. Editions are mentioned of 1640 and 1664, and also a Spanish edition, Brussel, 1688. John Mead's *Tables,* Strasburg, 1619, contain sines, tangents and secants, squares, and cubes. Those of Adrian Mictus, 1633, give a complete canon, to minutes, to seven decimals. In 1627 Snell published his *Doctrine triangulorum canonum,* Leyden, 1638, containing complete canon to seven places. Struige's *Synopsis Trigonometricum,* Danzig, 1616, gave a five-decimal canon, to minutes. Albert Girard's *Tables des sinus,* i.e., Haque, 1636, are to five decimals; there was a Dutch reprint in 1629. Adrian Romanus gave tables (Delambre, *Astr. Mod.*, vol. ii. p. 35) in 1609; 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.

Aldred's *Encyclopedia* (1649), the earliest work which has been 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 of the latter.

§ 6. We shall now add something to our account of logarithmic tables, including a fuller description of a few of those mentioned in our former article. The date and name, when 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 $e = 2.7182818...$ 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 100,000. And if $N$ be a sine and $L$ the logarithm of it, as they stand in Napier, the equation connecting them is

$$L = \log_{10} N - 10,000,000 \times 10^{10,000,000}$$

Delambre proposes to call them *Napierian* logarithms, and to restrict the term *hyperbolic* to the modern Napierian or $e$ logarithms.

1618. Benjamin Urania. The *Magnus Canon,* besides

[...]

In his preface he says, *Mammatomo astroem, bone Deus, quantum et quocumque syno theou ologassmnto. Ex quarto panditam est hoc secundo, utinam Theologiae non incommunientur, hos auere, quos saepe aere, quos semper et seorsum.* Perhaps the union of the characters of divine and mathematician gives a prouder right to speak well of the latter; for Barrow says, *Theorometriae caelestium, tali erat animus, aut anima, quae diu est, patiens genere hominum est mathematici.* We accept the el saecurum, for there is no saying how the moderns might translate the first epithet.
by Montucula, and the history of the book is as follows:

Kepler had stated that Byrgge had invented the very same logarithms as Napier many years before the latter published and got them published by Wittenburg. Without going into the work on perspective (Casell, 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, 100, 1000, which have also been kept by the author of the text at Prague in 1620. This announcement contained no notice, until Kistiner informed Montucula how he had come across some old tables which he had bought, and which had lain by neglect. And in these old tables, he says he found the work of Byrgius. This occurs in the second edition of Montucula's History, vol. ii. p. 10; see also Kistiner's History, vol. ii. p. 375, and vol. iii. p. 14; and Delambre, Hist. de l'Abs. Mod., vol. i. pp. 660-666. It will be noticed that Byrgius did not publish till six years after Napier; so that in all probability Napier is first in point of invention as well as publication. His system begins with the logarithms and 10 as a number; for every increase of the logarithm by 10, the product is multiplied by 10000, so that 10n has for its number 10000 (10000)−n. This is undoubtedly a rude table of logarithms, or rather of numbers to logarithms: and since Byrgius carried it up to 200,000, the number 10n for each number, to make real the radius ten millions. There are five columns, of which this is a specimen:

<table>
<thead>
<tr>
<th>40° 40' 26&quot;</th>
<th>16° 10' 00&quot;</th>
<th>49° 50' 59&quot;</th>
<th>355.3474</th>
<th>42° 4' 4&quot;</th>
</tr>
</thead>
</table>
| This table has 701, and the sine being 7010000, the angle is 40° 40' 26". The logarithm is 355.3474. And if 1000 represents 24°, then 701 represents 49° 50' 59": while if 1000 represents 60°, 701 represents 42° 4' 4". We were wrong in saying that it was this set of logarithms that was republished in 1700, as will presently appear.

1624. John Kepler, *Chilias Logarithmorum*, Marburg, and 1625, *Supplementum ... continens Pseudepota de curum Uniformium Proportionum e Theodoro Dillingenius*. See a very full account of them also in the first volume of Delambre's History of Modern Astronomy. The logarithms are strictly Napierian, 0(1)10000, but for these entries are put to the number on each number, to make the radius ten millions. There are five columns, of which this is a specimen:

<table>
<thead>
<tr>
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<th>16° 10' 00&quot;</th>
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1626. Wingate, *Arithmetische 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 *privilege* and other things, that this was the first edition. That date appears on the subject, and on all the other edition, to be April 14, 1625. The first edition is from the same types, except in their title-pages, and a page or two of the parallel explanations. The latter has also an addition to this subject, as would have been expected, and has also additional (perhaps, for the same thing may have been torn out of our copy of 1625) a folding sheet of mean proportionals between 10 and 1. The contents are,—seven decimal logarithms of numbers 0(1)10000 with interpolation differences, and 0(1)45° logarithms of sines and tangents. This is the introduction of Briggs's logarithms into France; that of Napier's was made, as noted, by B. Vincent: but the dates should have been 1619 for the *Descrip.,* and 1620 for the *Constructo.*

1626. Hinorin. In our former article we left this work in doubt. Now we learn that Hendron wrote on the propositional comparisons in 1626 (reprinted in 1681) and on the rule of proportion (which we take to be Gunter's scale) in 1626; and that this last work consists of seven pages, and is rather a 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 a copy we find in the Bodleian. There is no table in the edition of 1626, and the table we find corresponds in every respect, except that there is no author's name: but no one except Vlacq can be mentioned, who was in the least likely to have printed logarithms at Gouda in or about 1626. And there we have no doubt is the real first

1853. J. B. Morin, 'Trigonometria Canonice Libri Tre,' Paris. Seven-decimal Logarithms; of Numbers 0 (1) 1000, with tables of Sines and Tangents 0 (1) 45°. R.
1864. Cruger, & yielding tan, as to Tables called, twenty-seven

Those every first tangents, algorithms natural

80° of Vlacq

1651. 1685. 1706. 

J. Deparcieux, "Harmonie Coelestes," London. The logarhythms have separate table-pages, and might, if torn out, pass for separate works. They have the decimal point and are to six decimal places. Sines and tangents 0 (1) 45° 45', 45' 45' 45', etc., 0 (1) 1000, without characters. Wing was a much more learned man than his reputation (which is that of an alman-cook) would imply.

1668. John Newton, 'The Scale of Interest, or the use of Decimally,' has a table of logarithms to ten decimals 0 (1) 10000 arranged in lines of decades, with a separate table of proportional parts.

1681. Vlacq, 'Tabulae Sinuum,' &c., Amsterdam: also 1693. Vlacq, 'Table de Sinus,' &c., Amsterdam; and 1681. Vlacq, 'Table de Sinus,' &c., Amsterdam, a great many small tables of logarithms bear the name of Adrian Vlacq. Those before us, which have the same introduction, one in Latin, the other in French, the third in German, have sine tangents, secants, and logarithms of sines and tangents, to every minute and to seven decimals. Also, seven-decimal logarithms from 1 to 10,000, headed H. Bricigg Tabula Logarithmicae. The same table and a second one are in 1706. Oeum, 'Tables des Sinus,' &c., Paris. This is really Vlacq in every particular as to the tables, though his name is not mentioned.

1695. Cursus et Mundi Mathematica, the first volume has seven-decimal tables; logarithms of numbers of 0 (1) 1000; of sines and tangents of 0 (1) 45', and the sines and tangents of 0 (1) 45'.

1704. Wm. Leybourn, 'Cursus Mathematicum.' This book has internal evidence of having been written before 1660. Seven-decimal logarithms of numbers 0 (1) 10000; six-figure logistic logarithms 0 (1) 8', and 1 (1) 12'; sines, tangents, and secants, 0 (1) 45'; the names cosine and secant not used.

1695. John Wing (nephew of Vincent), 'A compleat Body of Trigonometry,' formerly published by Vincent Wing, London. Five-decimal logarithms of sines and tangents, 0 (1) 1000; of numbers, 0 (1) 10000. 1704. J. H. [arris], Table of Logarithms, quarto, mentioned in Hutton's sale catalogue.

1705. (Second edition.) Anonymous, 'A Table of Logarithms for Numbers increasing in their natural order, &c., London. Six-decimal logarithms of numbers 0 (1) 10000. The last printed part has a separate title, 1704, 'A Triangular Canon Logarithpic,' London. Six-decimal logarithms of sine, tangent, and secant 0 (1) 45'. As far as appears, this table was got up by J. Seller and C. Price, mathematicians in the King's service, who have not scrupled to sell their own table of logarithms as well as their own quadrants.

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 logistic. There is also a table of proportional parts for every integer from 44 to 4300. These tables, except the last, seem to have been published by Burnet.

1721. In this year was printed at Pekin, by command of the Emperor Kang-Hi, in Chinese type and in three folio volumes, Vlacq's logarithmic tables of sines, &c., to ten seconds, and of numbers to 100,000. (Brunet, from Vega, who had seen it in Vienna.)

1741. Depariieux, 'Noueaux Traite de Trigonometrie Rectiligne et Sphrique,' Paris. Depariieux is so much better known by this work that all the following authors are neglected. The tables are all to seven decimals (though the decimal point is not used). There are logarithms of numbers 0 (1) 20000; sines, tangents, and secants, &c., 0 (1) 45' 45' 45', and logistic of the trigonometrical parts has a separate title, 1741, 'A Triangular Canon Logarithmic,' London. Six-decimal logarithms of sine, tangent, and secant 0 (1) 45'. As far as appears, this table was got up by J. Seller and C. Price, mathematicians in the King's service, who have not scrupled to sell their own table of logarithms as well as their own quadrants.

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menètes et perfectionnes 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 also firm (in hand, method, tables), a manuscript volume containing sines to every second, to how many places does he not say; shortly afterwards he sent the tangents. Lalande gives a hint that the approaching publication of Taylor's logarithms prevented any steps being taken to print these. He also states that there was in the library of the Academy of Sciences a manuscript of Mouton, giving the logarithmic sines and tangents of 0 (1°) to 11 figures; we suppose he means to ten 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 of columns. Some corrections of Callet, discovered by means of this manuscript, were printed in one of the Nautical Almanacs.

1794. George Vega, 'Theorum Logarithrorum completus, Leipsic, 1812,' page 1 and the following pages, contain an account of common logarithms 1 (1) 10,000, 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 figures of each. Logarithmic sines and tangents to 10 decimals, 0 (1°) 2° (10°) 45°. Since 0 (1°) 12° to ten decimals. Lengths of arcs to 11 decimals. Wolfram's hyperbolic logarithms above described, reprinted from Schulze. 1794. J. G. von Nordmann, 'Logarithmisch zur Auffassung kauflännischer Rechnungen,' Commercial logarithms. The plan is to have logarithmic tables for integers and different sorts of fractions, among which eighths, 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. Ideker, 'Nouvelles Tables Logarithmiques calculées pour la Division décimale du Quart de Ceracle,' Berlin. Delambre speaks highly of this table; but he is surprised to see it reduced, more particularly as those which himself and Borda published. Meaning by 1° the hundredth of the right angle, and 1' being 0°01, and so on, Robert and Ideker's division of the quadrant is 0° (1°) 15° 15° 30° 45° 60°; but Delambre says, 'Robert's, which if not given correctly in our last article, is 0 (1°) 5° (1°) 3° 10° 45° (1°) 60°.' 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) 100 and 999 9980 (1) 100 0021, all to 36 decimals.

1802. J. R. Taschemacher. 'Tables calculated for the Arbitration of Exchanges, both Simple and Compound,' London. This is a book of commercial logarithms, though the author wisely avoided frightening the merchant by mentioning in his preface of his book, it is one table 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, and throughout so simple that they are simplified. We are fully of opinion that such a work might be very useful.

1806. Thomas Whiting. 'Portable Mathematical Tables,' London. This is in two parts. This book, it is one table 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, and throughout so simple that they are simplified. We are fully of opinion that such a work might be very useful.

1808. Ebert. 'Adriani Vlacq Tabulae Sinuum,' Leipsic. 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 logarithm tables from 1 to 10,000, and these with differences. 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 of natural sines, &c. Natural and logarithmic versed sines, the latter continued to 10°. A table to convert secants into decimals; and logarithms from 1 to 180°, to 15 decimals. A different arrangement from the usual one in several respects.

1812. In Zach's Monatliche Correspondence, vol. xxi, page 498, Gauss proposed his logarithms for the finding of log (a ± b) from log a and log b (Logarithmen, Gauss's, P. C. S.) with a specimen. He stated that he had the habit of using five-figure tables of his own construction. Gauss has given a short review of Paquich's tables (next mentioned) in the 'Gottinger gelehrte Anzeigen,' 1817, No. 158.

1817. J. Pasquich, 'Tabule Logarithmico-Trigonometrice contracta,' Leipsic. Title and explanations in both Latin and German. Five decimal logarithms of numbers 0 (1°) 10,000; logarithms of sines and tangents 0 (10°) 56°; five decimal logarithms of sines and tangents, with a table of the squares of sines and tangents 0 (1°) 45°; Gauss's logarithmica. (Logarithmen, Gauss's, P. C. S.) A recent edition of these logarithmic tables, with logarithmic and trigonometric squares of sines is, we suppose, almost unique.

1817. C. F. W. von Neumann, 'Der Logarithmus in Beziehung auf die Zahlen der ersten 45°,' Leipsic. Gauss's logarithms in existence. It is to seven decimals, and A proceeds as follows: 0 (0001) 2 (0001) 3 (01) 4 (1) 5 (1). 1819. Nordin, 'Adriani Vlacq Tabulas,' &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 twelfth 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, Leipsic, contain Gauss's tables, to five decimals, with proportional parts.

1821. Matthiessen, 'Gemeine Logarithmen,' &c., Altona. Stereotyped. This table has five-figure logarithms from 1 to 10,000, with a supplemental table of proportional parts, arranged on the two sides of a folding sheet, on canvas.

1823. Encke's four-tables of Logarithmica, &c., Berlin, contain Gauss's tables. See '1824, Wartenberg,' below.

1824. J. P. Gruner, 'Beschreibung Logarithmische Tafeln,' Berlin. A second-hand copy. Berlin. Five decimal logarithms of numbers 0 (1°) 10,000; squares and cubes, square and cube roots 0 (1°) 1000; arcs of the circle; logarithmic sines and tangents 0 (1°) 45° (1°) 60°. 1825. H. G. Köhler, 'Tafels Logarithmum,' &c. An edition of Lalande which gives Gauss's logarithms.

No date. (stereotyped.) Moritz von Prasse, 'Logarithmische Tafeln,' edited by Mollweide, and then by Jahn, Leipsic. Five decimal logarithms of numbers 0 (1°) 10,000; of sines and tangents 0 (1°) 45° put together in a new way, so as to separate the common figures, in the logarithms of numbers, and to get five degrees into a double page, sacrificing the differences. Gauss's tables, A, having, 0 (01) 3 (01) 4 (1) 5 (1); and a modification of Gauss's table, in which log x is the argument, and log (x + 1) the tabular result, x going through 382 (001) 2 (001) 3 (01) 4 (1) 5. An edition of Von Prasse was published by Halma, at Paris, in 1814; and the last-mentioned tables was published separately by Weldenbach, Copenhagen, 1829.

1838. G. B. Airy, 'Appendix to the Greenwich Observations, 1837.' London. A table of sines and cosines, with the arguments given in degrees, minutes, and the right marked. 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 8° repeated, with transformation, for four times; so that the whole consists of four tables, each representing one table. It is to five decimals, without differences.

1839. Anonymous (Useful Knowledge Society). After the first tirage, the following addition was made:—One page,
To our old tables of interest we have to add the following. Stevinus, in the 'Practique d'Arithmetique,' appended to his Arithmetique, Leyden, 1644, reprinted by Albert Girard in Stevinus's 'Collected Works,' Leiden, 1625, gave the following tables of compound interest and annuities. They precede the famous tract La Disme, in which decimal fractions were first proposed. And as this Practique should rather have been at the beginning than at the end, if rational arrangement had been studied; and if the Disme again should have preceded it, on the same supposition; we must infer it to be most likely that the tables were placed in the order in which they were published. In this case, there is every certainty that these tables of compound interest suggested decimal fractions, the account of which speedily follows them. They are constructed as follows:

Ten millions being taken as the base (which calls it), and a rate five per cent, being chosen, the present value of ten millions due at the end of 1, 2, &c., up to 50 years, are put in a column, to the nearest integer. By their sides are the sums of their values, which give the results of all the annuities of ten million, as follows:

<table>
<thead>
<tr>
<th>Table d'Intérêt de pour 100.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9528310</td>
<td>9528310</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9070295</td>
<td>18554105</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8618597</td>
<td>37558565</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>8227025</td>
<td>35459560</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>7855253</td>
<td>33354555</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7502299</td>
<td>31249549</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The rates are from 1 to 16 per cent., and also for 1 in 16, 5, 10, 12, 15. At each, in 12, &c., to 1 in 22; or, as the French say, denier quinze, denier seize, &c. At the end is a direction to dispense, when convenient, with some of the last figures.

There is then 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 Scale 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. Pocock, in his Bibliography of Annuités, &c. (Familiar Explanation . . . of Assurances upon Lives, London, 1643), gives the following works, which we do not remember to have seen:—'Tables of Leases and Interest . . .', London, 1628, 12mo.; and William Purser, 'Compound Interest and Annuities, containing the Art of Decimal Arithmetick,' London, 1638.

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. There is here what we never meet with elsewhere—'the angle of compound interest, with several examples, from some sänt 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 5, 4, 3, 2, 1, 0, and 1/10 per cent. Poor Ann.' also tables of annuities, interest at the same rates, whereby, &c. By John Smart, at the Town Clerk's Office, London: London, 1707, 4to. (duodecimo size). The second edition, of 1726, is as large, compared with the first, as the table of its author 12mo. of Guildhall, Gent. may have become, compared with the subordinate at the town clerk's office. The first edition which we did not know of when we wrote our last article would find all modern writers knew as little), besides a smaller range of rates, has not the half-yearly, and has only six decimal places. The tables of simple interest are also of very little extent. This set of tables has been incorporated in his Acnowledgments 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,

To be seen the Bibliography of Arithmetical works, by the author of this article, intended for the use of the Association for the Advancement of Learning.

Since this was written we find that Mr. Farr (Reg. Gen. Rep. 1644, p. 407) mentions the edition of 1725 as the second edition.
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 Smart, &c. Leandor's 'Tables of Sines and Tangents,' &c.

Commercial tables of any real power are rendered impossible in practice by the use of shillings, pence, and farthings, except by an extent of matter which makes them very unimportant to the people that use them. The parts of a pound [Computations, P. C. S.] were well correlated and properly used, some of the older tables, which have fallen entirely into oblivion, would certainly be revived with either more labor or less accuracy. These tables could certainly be reprinted when the time comes; Brown's 'Arithmetica Infinita,' and Webb's 'Tables for buying and selling Stocks.' The main part of the former is the first nine multiples of the decimal, which express the number of farthings in a pound. Thus, under 7s. 8d. are 3854166... and its multiples up to nine times. The latter has the multiples necessary to find the quantity of stock which awant to any sum of money, and nice error, 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 'Assurances 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 whole with the 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, or a part of it, or several lives, or a survivor, or a subsisting 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 logarithm set down by its side ready for use. Why it is so coldly looked at by the assurance offices, those who study the human mind will be no loss to decide. The typography is so beautiful, the paper and type so luxurious, that a century hence a copy will be an object of veneration to the Hebrew and Spencers of that day. We believe it to be a work of great accuracy.

In the preceding articles [Tables, P. C. and the present one] we have described, we believe, all the tables of note, whether in history or practice, as far as general tables of pure mathematics are concerned. We have omitted those which relate only to astronomy, life contingencies, or any other special application of mathematics. Altogether, we have brought forward about 318 tables, of which 221 have been taken from actual inspection, and the remainder from various catalogues and other works. At the end of each of these tables is a notice made to the eye by the 7th of La Place's Bibliographic Astronomique there are 208 tables mentioned, including astronomical ones. In the Royal Society's Library the entries under tables, of every sort, marked by the symbol, are classified by the council of the college, &c., &c., &c. are 563 in number, including from the nearest title-date for one year up to the largest body of logarithms. And upon looking at the appearances which the different catalogues present, we do not find one in which 200, or even 100, tables of pure mathematics are mentioned as having undergone the actual inspection of the compiler. It would not, then, we suspect, be a very extensive undertaking to make as complete a list of tables of all kinds as can now be recovered; and the undertaker of it might expect to be able to verify about two out of three from inspection.

TACK is the technical term in Scotland for a lease, which is the rent called the tack-duty, and the tenant the tacksman. The Scottish system of leases having lately attracted some attention, and being intrinsically important, a separate sketch of its more prominent peculiarities seems desirable. A lease is a contract, which is subsisting or has subsisted for a limited period, called the duration, is purely a contract, and does not paralect—at least in questions between landlord and tenant—of the peculiarities of the feudal system. In early times it is possible to trace something of the nature of the obligation, in which the tenant is bound to the landlord. In Scotland, however, there was no permanent interruption or suspending of the contract; and thus all descriptions of permanent estates could be constituted in the land by the pure adaptation of the feudal usages. There was no temptation to convert the contract for the limited occupancy and use of the land into a means of constituting a semi-

proprietary right in it—of supplying with a lessee the place of a sub-vasal; and the system of leases, as one of mere letting and hiring, took its principles from the Roman contract of locatio conductio, with the right of the lessor to have the use of the land, so purely personal that it was ineffectual against a party acquiring the lands by purchase from the lessor; and so early as 1449 a statute was passed, preserving the rights of the lessor, when the tenant had conveyed the leasehold right, however, in questions of succession, and in the form of attachment, employable by creditors, have by usage come into the position of real or heritable property. In the civil laws, on the other hand, the tenant of a lease, such successions follow the rules applicable to landed property. It has been matter of much regret, that the system by which feudal rights in land may be subjected to real burdens, has not been extended to this species of property, so as to enable valuable leases to be burdened with a security for borrowed money, or a guarantee fund for provisions for children. The system of granting and recording public feudal titles not being available for this species of property, all attempt to accomplish this object, by the tenant assigning the lease and retaining possession as the assignee's sub-tenant, have been ineffectual against the rights of creditors. It has been frequently proposed to pass an act creating a system of registration of leases, and of burdens affecting them.

It is unnecessary to state very minutely the title which a person who has a right to grant a lease, or parties who may hold leases, or the nature of that title which constitutes an ordinary lease, as these bear a generic resemblance to the corresponding features of English law. Long leases however being the prominent feature of the Scottish system, those cases in which there is a restriction on granting them may be noticed. A person who has a life-rent interest is, in the general case, not entitled to grant a lease to last beyond his 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 has been an argument for granting leases to 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), at the rent struck by the vendor when he was at the Launceston, were found to be in the possession and power of the landlord, and could be alienated as a 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 an heir of the soil, and Mill has shown that he has an interest to impugn the contract.

Writing is necessary to constitute a lease, although possession during the part which may remain over of a year begun, may be held as a right from suffranchis 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 subletting is permitted or prohibited is set forth, and provision is made for the arrangements in case of death of either party. 3. Clause of Possession, describing the subject let. 4. Duration. 5. Reservation, if there be any rights such as that to minerals or game reserved by the landlord. 6. Landlord's Meliorations, concerning such as he may be bound to make to improve the subject as the landlord undertakes. 7. Warranties, or guarantee of the title given to the tenant. 8. Rent clause. 9. Tenant's Meliorations, setting forth such improvements as the tenant has not agreed to undertake. 10. Treasurer's accounts, containing provision to keep the building, fences, &c. in repair. 11. Insurance, in which the tenant becomes bound to insure the buildings, crops, &c. against fire and storm. 12. Rightlet, the clause, &c. are now comparatively seldom found by the tenant to bind the tenant to grind his corn at the mill of the over-landlord. 13. Management. 14. Bankruptcy, providing in general for the landlord's resumption of the lease if the tenant becomes bankrupt. 15. Removal, by which the tenant engages to
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evacuate 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. Performance (in varying forms, T.C.S. 31). 19. Tenancy 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 subject the tenant to the observance of a particular course 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 chemical cultures. 20. Landlord. 21. Borristy and Life, the grass, 22. England. 23. Frames and Tenantry. 24. Family, the one. 25. The expected, It shall be the rule. 26. Generally, that the grass, a long, and reach to the base of the cu. 27. The ventrals are moderately developed. The Cepola rubescens, a beautiful species, of the fins. 28. The true horse, is occasionally found on the southern coasts of Britain. 29. The genus Lophotes of Giornia has a short head with a bony crest bearing a long and stout spine. The caudal fin is differentiation genus. In a list, and, shark in domestic use, it is often found of the southeastern coasts of Britain. 

TAGORE, DWARKANATH. [RAMMOWUN Rot, P. C. S.]

TALEZIE, in the law of Scotland, is the technical term corresponding with the English word Entail, which now generally superseded it in colloquial use, even in Scotland. The early history of Entail law in Scotland in some respects resembles that of England, 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. I.) to favoring that是什么？

TENIOTTERIS, a group of fossil forms with broad ribb-
coming to pass, should cause a nullity. (Duffin’s Travels v.
Dunkar, 28th January, 1844, 4 D. B. M. 523.) Some
statutory enlargements have been made on the powers of
parents to provide as best they may for 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.

TAJRURAH is a sea-port in Africa, situated at the most
western corner of the Gulf of Aden, in 10° 47’ N. lat. and
43° E. long. It is built on a low shore of sand and
silt, 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 is secure, except during the north-western monsoon, and
is situated near the island of Jezirah, which is 30 miles
west of the island of Shoa. (Adams, 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 is conducted through small market-stalls, with
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 and June the market is at its height, and the goods
are purchased and the money changed at the time of
the chief of the whole nation. None of the Dandali 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 Dandali and Somalul, 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 we do not know if they are actually taken possession
of.

(Iseenberg and Kräf t’s Journals, detailing their proceedings
in the Kingdom of Shoa; &c.; Kirk’s Report on the Route
from Tajurrah to Anodak; The Friend of Africa, 1841.)

TALLOW (French, tallow; German, talle; Italian, sebo;
seco; Russian, sedlo, toplomos; Spanish, sebo) is animal fat
[Fox, P. C., 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.

A very large proportion of the tallow used for making
candles in this country is supplied to the market, and acco-
Accomplished to a paper on ‘Artificial Light from Solid Substances, and the
Manufacture of Candles,’ published by Arthur Alkin, Esq., in the fifty-second volume of the ‘Transactions’ of the Society of Arts (part ii., pp. 153-127), is fitted for use by the renderers,
who chop into pieces the fat and meat received from the
butchers, and boil it in water, by which operation the
greater part of the fat is melted out from the membranous
ducts to the top of the meat. The remaining
fat is subsequently squeeved from the membrane by a
powerful press, leaving the membranous matter in the form of
a sheet or block, of a dark colour, which is called gyros,
and which is destined for the manufacture of soap. This
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.,
calls ‘Tallow Candle,’ styles the refuse membranous matter crackerings;
states that the operation of rendering should be performed
as expeditiously as possible, and does not manage it
without the presence of young 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.

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 branch of industry, and describes its manufacture in the
translation, published in Chapman and Hall’s Foreign Library,’
1842, pp. 501-503), we conclude the following par-
ticulars:—The exports of St. Petersburg, he states, are
estimated to amount to 30,000,000 lbs. annually, or
adequate; the tallow is strained through a sieve into a second copper, and
there treated with water at a boiling temperature of 120 lbs. in
weight, and is then thrown into the boilers, where it is allowed to
remain for four to six weeks, so that the tallow is rendered
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; and the article is in addition to the large
quantity consumed by the Russians themselves. Nearly
the whole of this enormous quantity is furnished by the
stage steppe, in the southern part of European Russia. ‘At
present,’ he observes, ‘the great tallow, or Bark Slack, is
furnished by the natives of Great Russia, who have their establishments in all
parts of the steppe. ‘They buy the cattle by hundreds and thousands, and after
transporting them through the steppes, they are sold for
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part
A further supply of fat, but of very inferior quality, is sub-
sequently obtained by subjecting the mash of bones and flesh to
fusible processes. 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 (250 to 290 lbs.) of tallow, which is
generally worth from eleven to fifteen rubles a pound. The
article is always so greatly in demand, that the merchants often
pay part of the price for it while the oxen 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 upon them, for while the status of the salgans on
which the oxen have fattened comes to receive his rent; the
workmen for their wages; cattle-dealers to contract for fur-
ther supplies of oxen, while perhaps some merchant is standing
by, equally secure and assured in advance for the tallow
that is to be produced by them; and a colonist comes in to bargain
for the fattening of some 200 hogs, which he afterwards
receives back walking masses of hog's-lard, too yellow and
crude however for the market, till the grutters have been
a little refined by sundry good foods of corn. Sometimes
a wealthy nobleman, possessing oxen, but no tallow-making
establishment of his own, makes his appearance to form a
salgan for a few weeks, while other persons, having no
means to buy the refuse-meat for feeding pigs on the steppe, or to
bargain for the hogs and hides.

The Turkish captains come eagerly to obtain the tallow in
its greatest purity at the fountain-head, for tallow is too much esteemed by the Ge-
mans of Constantinople to be idly wasted in enlightening their
darkness; in short, however hastily death may be at work,
there is, meanwhile, no want either of life or blade in the
salgans.

Notwithstanding the nature of the employment, there are
always plenty of hands found to seek engagements in the
salgans, the wages being high. The workmen usually earn
about one ruble per month during the winter, which is
about two or thirteen weeks. In the neighbourhood
of Odesa, Kohl states, there are seven salgans, in which pro-
ably 25,000 oxen are killed every year, besides countless
sheep. In the vicinity of Nikolayev, Saratoff, Kihneff, and other places, he adds,
their number will be found on an equal large scale.

From details quoted in M'Culloch's 'Dictionary of Com-
mmerce', by Burnow of St.

Petersburg, 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 emballage, or warehouse, is appropriated to
the reception of the tallow on its arrival, in which it is
selected and assorted (or bracked) according to quality, after
which the casks are marked with the quality, the date of the
selection, and the name of the bracker or selector. The
weight of the tallow usually brought in coastal casks, 24 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-candle-tallow, when good,' according to this author,
should be clean, dry, hard, when broken, and of a
fine yellow colour throughout. The white candle-tallow,
when good, is white, brittle, hard, dry, and clean. The best
white tallow is brought from Woronouch. Soap-tallow
should be clean, strong, and of a fine yellow tinge throughout.
M'Culloch states that 120 poods of tallow, gross weight
(of which the cask is usually about 10 per cent.), make a Peters-
burg last, and 63 poods an English ton.

A great many articles are prepared from the tallow, but
the practice of mixing different kinds of tallow together according
to different requisitions for 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 is inferior, as it saponifies less readily, and is fit for
beeswax, give an offensive smell, and produce a thick black
smoke; and Dr. Ure states that *mutton-ox*, with a propor-
tion of ox-tallow, is selected for mould candles, because it
fills them more closely and consistently. When weighed in
the proportions, and cut up into small pieces that it may melt
more readily, the tallow is, according to Alkin's account, put
into a boiler with some water, which tends to prevent its
formation of small globules, and melted a small pavement of about
90°. Some water is then sprinkled upon it, which has the
effect of causing such drops 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 receptacles,
and, when sufficiently cooled, but while yet retaining its perfect
transparency 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 deposited about the sinews being
in all animals, harder than that found in the cells of the bones;
and especially that half of the fat found in the muscles and
other soft parts; while the fat of some animals is harder than
that of others, and it has been found that oxen are much
more likely to melt than that of the ox or horse. According
therefore to the different kinds of fat which may enter into
its composition, tallow will be found to vary considerably in its
temperature of melting, and its fluidity. For instance, the
best point, though Alkin states that he had seen a boiler-full of
tallow perfectly fluid at 70°, and even then not sufficiently
cooled to be made into candles; nor was this case, he observes,
considered remarkable; whereas we may conclude that tallow,
made into candles and exposed to the air, loses much of its
fluidity. The author of the article above referred to in the
Encyclopaedia Britannica, observes that no water should be
mixed with the tallow, nor any mixture with the oil, or with
the wicks, being quite dry, should imbibe it, and thus cause the
wicks to spatter in burning. He adds that in removing the
melted tallow from the boiler to the tub or vessel in which the
wicks are dipped, it may be passed through a coarse horse-
hair sieve, to purify it the more perfectly; and that it may be
used after standing three hours, and will continue fit for use
about twenty-four hours in summer and fifteen hours in winter.

The mode of manufacturing both dip and mould candles
being described under CANDLE. P. C., p. 236, we need only,
upon this subject, refer to a fuller account of the process,
illustrated by the directions given in the article. A very
employed in an extensive candle-factory, including one by which
the operation of dipping is so facilitated as to enable a man
and a boy to make nearly 26,000 candles, of twelve to a
package, in twenty-four hours, or a day, in the afternoon, in the
*Penny Magazine*, No. 631, description of

'A Day at a Soap and Candle Factory.'

'A recently made candle of good quality,' observes Alkin,
"is of a good fine, close, and even white, of a fine yellow
colour, which is the true colour of some of the best tallow,
which is not dry enough to be taken up by the wick. It is
necessary to put it a little into a vat of brandy, and
keep it there a little while to make it more dry; then
sputter when set fire to, and give to a comparatively feeble
light, the two latter qualities showing that it contains a little
water. If kept three or four months, he proceeds, 'in a
box placed in a cellar (for the presence of the sun's rays is
by no means necessary), the candle will be found bleached
both inside and outside, will be harder than at first, and
will then burn with a clear flame undisturbed by any spattering.
It is evident therefore that the water has been evaporated
and it is also extremely probable that the water, or the air
which the water holds in solution, has acted chemically on the
tallow, bleaching and at the same time hardening it.'

This bleaching process, he adds, 'goes on slowly in a cold
and damp atmosphere; it being found that autumn-made candles
hardly ever bleach to a good colour, although in three or four
months they are fit for use. Candles made in March bleach
the best of any, for the three or four months during which
they are kept in the manufacturer's store are usually dry and
warm.'

'Tallow-lamps, as well as some recent improvements in
the manufacture of candle-lamps, are treated of under Lamps, AVTIP-
P. C. S., p. 263.'

TANACETUM, a genus of plants belonging to the
natural order Compositae and the sub order Corymbiferae. The
flowers are usually white, yellow, or purplish; the receptacle
is imbricated, the receptacle naked, the fruit oblong and anga-
This act reduced the duty on about 750 different articles on which the receipts had amounted to about 270,000. The general principle of the measure was to reduce the duty on raw materials to about 5 per cent., to limit the highest duty on certain manufactured articles to 12 per cent., and 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, sole, and other fish, and fresh beef and pork, which had been prohibited 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 most raw wool (about 80,000), and on 480 other articles, on which the duty amounted to 390,000. By this plan expenses of warehousing are saved [Warehousing System, P. C.], and a number of troublesome and impeding acts in businesses, 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 cheese, calves, etc., were 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 'An Act to repeal the several acts relating to Customs. 30 acts relating to Customs, Trade, &c. of which 26 acts were repealed. Cap. 85 is 'An Act for the Management of Customs, and regulates the appointment and duties of officers, the taking of land for warehouses, &c. Cap. 86 is 'An Act for the Registration of Customs, and relates to landing, warehousing, and custom-house entries. Cap. 87 is 'An Act for the Prevention of Smuggling,' and specifies the acts which constitute smuggling, and the penalties. Cap. 88 is 'An Act to repeal the several acts relating to Customs, and imposes duties upon certain articles. These duties are referred to in the preamble of the Tariff (9 & 10 Vict. c. 23) hereafter mentioned.' Cap. 89 is 'An Act to regulate the Trade of British Possessions abroad. Cap. 94 is '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 Sir Robert Peel's last tariff, which carries out still further the principles of freedom of trade, produced 38 acts. The following table of the tariff of 1833, showing the duties received in 1838-9, is an analysis of one prepared by the inspector-general of imports for the parliamentary committee to which allusion has been made:—

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>1.</td>
<td>Articles produced on an average less than 24.</td>
<td>54</td>
<td>8,000</td>
</tr>
<tr>
<td>2.</td>
<td>Ditto less than 240.</td>
<td>152</td>
<td>31,620</td>
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<td>3.</td>
<td>Dito less than 713.</td>
<td>45</td>
<td>32,050</td>
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<tr>
<td>4.</td>
<td>Dito less than 2,900.</td>
<td>107</td>
<td>24,935</td>
</tr>
<tr>
<td>5.</td>
<td>Dito less than 18,190.</td>
<td>6</td>
<td>1,397,394</td>
</tr>
<tr>
<td>6.</td>
<td>Dito less than 183,364.</td>
<td>10</td>
<td>1,538,630</td>
</tr>
<tr>
<td>7.</td>
<td>Dito less than 2,063,885.</td>
<td>9</td>
<td>15,575,071</td>
</tr>
</tbody>
</table>

8.  Articles on which no duty has been received | 147 | 5,396 |

In 1840 Mr. Porton, of the Board of Trade, in his evidence before the Parliamentary committee on import duties, showed that out of a total amount of 22,962,610. of Customs duties received in 1839,

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
<th>Quantity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>articles produced 94% per cent. or</td>
<td>2,700,000</td>
<td>30</td>
</tr>
<tr>
<td>19</td>
<td>articles produced 95% per cent. or</td>
<td>1,526,561</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>articles produced 98% per cent. or</td>
<td>2,995,291</td>
<td></td>
</tr>
</tbody>
</table>

In 1842 Sir Robert Peel effected some improvements in this system, which were carried into effect by 6 & 6 Vict. c. P. C. S., No. 162.

Wheat, per quarter, under 48s. | 10 | 48s. and under 49s. | 9 | 49s. and under 50s. | 8 | 50s. and under 51s. | 7 | 51s. and under 52s. | 6 | 52s. and under 53s. | 5 | 53s. and upwards | 4 |

Barley, bear, or bigg, per quarter, under 26s. | 5 |

Vol. 11. - 4 1.
Barley, 25s. and under 27s. 6d. 4 6
27s. and under 28s. 6d. 3 3
28s. and under 29s. 6d. 2 9
29s. and under 30s. 6d. 2 0
30s. and under 31s. 1st. 1 3
31s. and upwards 2 0
Oats, per quarter, under 18s. 4 0
18s. and under 19s. 3 1
19s. and under 20s. 2 2
20s. and under 21s. 2 0
21s. and under 22s. 1 6
22s. and upwards 1 6

On rye, peas, and beans the duty is equal in amount to the duty payable on barley. But there appears to be some bilateral action on rye, peas, and beans being regulated by the duty on barley, is regulated by the price of barley, and not by the price of rye, peas, and beans. The consequence of this is that the duty on barley is 26s. the quarter, and is paying 5s. duty, rye, peas, and beans will pay 5s. duty, whatever their respective prices may be; and they will only pay the lowest duty of 5s. per quarter when barley is 31s. and upwards the quarter. (See 'Economist.' Newspaper, June 4th and 11th, 1846.) The duties payable on all flour and meal, as above enumerated, until the 1st February, 1846, are enumerated in the schedule to the act. The average price, both weekly and quarterly, of all British corn, to continue to be made up according to 5 & 6 Vict. c. 14.

Of the exemptions from duty and reductions of duty made by the last Parliament (9 & 10 Vict. c. 22), it will suffice to mention a few of the most important.

No duties are chargeable on the following living animals:—
even and bulls, cows, calves, horses, mares, geldings, colts, foals, mules, asses, sheep, lambs, swine and hogs, sucking-pigs,

No duties are chargeable on bacon, beef fresh or slightly salted, salted, not being termed beef, most fresh or salted, not otherwise described, pork fresh, salted (not hams), potatoes, all vegetables not otherwise enumerated or described, bay, hides, and some other articles slightly wrought, and a few wholly manufactured.

Of the reduced duties the following are the most important:

—ale and beer of all sorts, 1l. the barrel; arrow-root, 2s. 6d. the cwt.; and if from a British possession 2s. 6d. the cwt.; pearled barley, 1s. the cwt.; and if from a British possession, 6d. the cwt.; buckwheat, 1s. the quarter; butter, 10s. the cwt., and if from a British possession 2s. 6d. the cwt.; tallow-candles, 6s. the cwt.; choose, 6s. the cwt., and if from a British possession 2s. 6d. the cwt.; cured fish, 1s. the cwt.; hams of all kinds, 7s. the cwt.; and if from a British possession 1s. 6d. the cwt.; men's hats, 2s. each; men's boots, 14s. the dozen pairs; men's shoes, 7s. the dozen pairs; women's boots and shoes, from 4s. 6d. to 7s. 6d. the dozen pairs, according to kind, as described in the British, or India; currants, 5s. the cwt.; pepper, 1s. the cwt.; rice, 1s. the cwt.; and if from a British possession 6d. the cwt.; sago, 1s. the cwt.; tallow, 1s. 6d. the cwt.

The duties on manufactured goods of brass, bronze, china-
ware, copper, iron, and steel, lead, pewter, tin, woollen, and cotton, are 10s. for every 100l. value. On silk manufactures the duties are about one-third higher, or 5s., 6s., and 9s. the lb., according to kinds, as described, or 10l. on every 100l. value.

The duty on foreign spirits of proof strength is 15s. the gallon.
The duty on foreign solid timber, from and after April 5, 1847, is 1l. the load of 60 cubic feet; and from and after April 5, 1845, is 1l. the load. On deals or boards, the duty, from and after April 5, 1847, is 1l. 6s. the load; from and after April 5, 1846, it is 1l. the load. The Tariff of 1842 is not altered with respect to timber imported from a British possession, which is still 1l. the load of solid timber, and 2s. the load of sawn timber.

The duties on coffee and tea are not altered by the tariff.

Sugar Duties.—On the 18th of August, 1846, the royal assent was given to an Act (9 & 10 Vict. c. 63) 'for granting certain duties on Duties on Sugar, Molasses, and Sugar- On sugar or molasses the growth and produce of any British possession in America, or of any British possession within the limits of the East India Company's Charter, into which the possession of foreign sugar is prohibited, and imported from thence, the duties following:—

Candy, brown or white, double refined sugar, or sugar quality in double refined, per cwt. 1 1 0
Other refined sugar, or sugar rendered by any process equal in quality to white, per cwt. 0 1 8 4
White dyed sugar, or sugar rendered by any process equal in quality to white dyed, not being refined, per cwt. 0 1 6 4
Brown sugar, being Muscovado or clayed, or any other kind not being equal in quality to white clayed, per cwt. 0 1 4 0
Molasses, per cwt. 0 6 3

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>Year of Import</th>
<th>From 1st July to 30th September</th>
<th>From 1st October to 30th November</th>
<th>From 1st December to 31st March</th>
</tr>
</thead>
<tbody>
<tr>
<td>1847</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1848</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1849</td>
<td></td>
<td></td>
<td></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>Year of Import</th>
<th>From 1st July to 30th September</th>
<th>From 1st October to 30th November</th>
<th>From 1st December to 31st March</th>
</tr>
</thead>
<tbody>
<tr>
<td>1847</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1848</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1849</td>
<td></td>
<td></td>
<td></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:—

Refined sugar, or sugar candy, per cwt. 3 5 0
Brown Muscovado or clayed sugar, not being refined, per cwt. 2 2 0
Molasses, per cwt. 1 6 8

TARUNTENUS PATERNUS, a Roman jurist, was Prefectus Praetorio under Commodus, by whom he was put to death. (Lamp. Commod. 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, 2).
mentioned ranges are separated from each other. This place occurs near 35° N. lat., and between 74° and 76° E. long., between Chitral and Gilgit, where a high mountain-mass, the Turcuan Mutanai, rises to nearly 18,000 feet above the sea-level. At the same time from this point the mountain-mass extends in a north-west by south direction to 45° N. lat., where its northern prolongation is known by the name of Kooy-urt; it lies between 70° and 71° E. long.

This mountain-mass is of great width, occupying between the parallels above mentioned all the countries which lie between 70° and 75° E. long. But we are not exactly acquainted with the limits of this range, nor with 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 38° 30' N. lat., and which goes by the name of Puchikut. 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 St-i-Kol, in which the river Oxus originates; it runs out from its western extremity. This lake is situated on the crest of a range, and is about fourteen miles long from east to west, with an average width of one mile. On three sides it is bordered by swelling hills, about five hundred feet high, but along its southern banks it rises into a series of snow-covered mountains, which are separated from the plains by a depression of 15,600 feet above the sea-level, their summits attain more than 19,000 feet. North of this lake lies an immense table-land, which is called Pauri, or, in the emphatic language of the native, Pat-i-Dher, in which three parts several large alpine lakes are stated to occur, and which we are not acquainted with their true position, nor with their extent. In 41° N. lat., the Bolor Tagh crosses the mountain range, which is called Dahan Oosteng and runs from west to east. That portion of the last-mentioned range, which lies west of the Bolor Tagh, is called Asferal Tagh, or Ak Tagh, and that on the east Terek Tagh. In these parts the Bolor Tagh appears to be a more elevated range, and it is probable that it connects Chinese Turkistan with Turan; but the mountains even here are always covered with snow. It is also stated that several snow-capped summits occur in the northern prolongation of the range, the Kooy-urt.

In the numerous valleys which open into the adjacent plains, and generally run east and west, different kinds of grain are cultivated. In the valley of Wakan (37° N. lat.), which is grown at an elevation of 10,000 feet above the sea-level, whilst in the Alps it does not succeed in Engadin, at a height of 6000 feet. These valleys are inhabited on the western side by the Kirghiz, the descendants of the ancient Persians. On the eastern declivity they are in possession of a population of Turkish origin, the Kirghiz. They are of the same stock as the numerous tribes which dwell on the same range in the wide desert plains which lie on the east and north of the Aral and Caspian seas. They appear also to be closely allied to the Uzbeks, as, according to the statement of Lieut. Wood, their language differs only in a trifling degree from that spoken in Kanduz. This bold traveller describes these mountaineers as being of a middle size, varying between five feet two inches to five feet five and a half inches in height. Their countenance is disagreeable. The upper part of the nose sinks into the face, leaving the space between their deeply seated and elongated eyes without the usual dividing ridge; the brow immediately above the eye is prominent, but slants back more abruptly than their cheek bones, and is humped, and toed, as if pieces of flesh had been daubed upon them. They have little beard, and with those individuals who have a more luxuriant growth of hair, both beard and whiskers have a curl. The hair of the head is long and thin, and its complexion is darkened by exposure to weather rather than by the sun. The women are rather good-looking, having a small and delicate form and fair complexion. The Kirghiz roam about in this region with their tents, and live mostly on game, fish, and yaks. The men use the does and Lamet. Wood thinks that this mountain-region is the true native country of these animals, which are called Bactrian camels. The yaks still less than the reindeer cannot bear a considerable degree of heat, and live always near the places which are covered with snow. The Kirghiz of this mountain-region acknowledge allegiance to Kokand, and pay a nominal tribute to its ruler, but with China and Tibet they are constantly at feud, and they rob all parties north of 35° N. lat., and it is probably beyond down from this region.

We know very little of the mineral wealth of the Bolor Tagh. Gold and silver are said to be found. In the sand of the Oxus gold is found in abundance, and in some parts of its lower course it is possibly by gold-diggers. Leaving Yarkand it gradually ascends the valley of one of the tributaries of the Yarkling-osteng river, and after passing the crest of the mountains near the lake of Sir-i-kol it descends through the valleys of Wakan (WAKHAN, P.C.S.) and Badakshan to Kunduz. This road does not appear to be much frequented. The northern road runs from Kanghai in Chinese Turkistan to Kokand and Tashkand. After leaving the first named place it follows the valley of the Kanghsirdir, or river of Kanghai to its source, then turns northward, passing over the crest of the Terek Tagh to Osh, in the valley of the Sir-i-diria, and crossing again the northern prolongation of the range, it reaches the Oxus, where caravans pass along this road, and exchange the goods of Chinese Turkistan for those of Bokhara and the other countries of Turan. (Ephraim's Account of the Kingdom of Cabid 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 Law, with a Summary of Statistical Information concerning the Amounts levied, and the sums received, in England, Scotland, and Ireland.' England includes England and Wales, but 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 authorized by general statutes or the common law; excluding such as derive their origin from commission Acts. 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 degrees of ago and common. 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 Constable's Rate; 6. The Highway Rates (these three are paid by the owners of land in the county for the maintenance of the county roadway.); 7. The Militia Rate. No. II. comprehends—1. The Church Rates (three); 2. The Sewer's Rate; 3. The General Sewer's Tax; 4. The Drainage and Inclosure Rates; 5. The Inclosure Rate; 6. The Regulated Pasture Rate. No. III. comprehends—Counts: 1. The County Rate; 2. The Police Rate; 3. The Shire Hall Rate; 4. The Lunatic Asylum Rate; 5. The Burial Rate. Borough Rates: 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 Rate. Counties and Boroughs: 13. The District Prison Rates.

The head of Tolls, Dues, and Fees, comprehends—1. Turnpike Tolls; 2. Borough Tolls and Dues; 3. Light Dues; 4. Post Dues; 5. Church Dues and Fees; 6. Marriage Fees; 7. Registration Fees; 8. Justiciary Fees. The following outline of the work published under the direction of the Commissioners, as an approximate summary of the present annual amount of the local rates in England and Wales (p. 178):—

<table>
<thead>
<tr>
<th>Parish Rates:</th>
<th>Poor-rate, including the Workhouse Building Rate, and the Survey and Valuation Rate.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relief of the Poor</td>
<td>£1,676,083</td>
</tr>
<tr>
<td>Other objects</td>
<td>£567,567</td>
</tr>
</tbody>
</table>

* The 8 & 9 Vic. IV. c. 25, the chief provisions of which act have been stated under BURMSEY, P.C.S., as amended by 8 & 9 Vic. c. 45.
The rates for Ireland are given at £1,631,818, 199,469.

The amount of annual local taxation of Great Britain and Ireland accordingly amounts to 14,197,044/. But it is observed that if the deficient information were supplied, it would appear that in Great Britain and Ireland the annual sum raised by the local and general taxation is about 57,000,000/. a year. The public expenditure for the year ending 31st December 1845 was 49,061,411, of which sum 29,315,672 was paid on account of the Funded and Unfunded Debt. This leaves somewhat under 21,000,000/ for the rest of the general public expenditure. Accordingly the present amount of the local taxation, 15,000,000/ is nearly equal to three-fourths of the public expenditure after deducting the payments on account of the Funded and Unfunded Debt. It is well remarked in the work from which these facts are derived (p. 190), '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 public fund, 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 Latrielle's arrangement of insects. They have no cuneous tooth on the inner side of the maxilla; the femora 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 fungi, beneath the bark of trees, or on the ground under stones. This family is divided into two tribes, of which the genera Dicoprops and Coexphus are respectively the types.

TAXITÉS, a coniferous fossil genus of plants from Stonefield, Cornwall.

TAXOCRINUS, the last generic name assigned by Phillips to the group of Escrinuna analogous to Taxisornis (Poteriocoris Egerioni). It has several synonyms. (Moeris's Catalogue.)

TAYLOR, WILLIAM, was born at Norwich, in the year 1765. He was the only child of an eminent merchant of that city. He first studied under a Swiss refugee, and afterwards was a pupil of Mr. Bostock, a Unitarian minister, at Falmore, a tutor chiefly selected on account of his religious opinions, which were those of Mr. Taylor and his family. To Mr. Barbauld, better known as Mrs. Barbauld, was indebted, in her early studies; aided by her assiduous care, he soon acquired a correct knowledge of the principles of English composition, and, in after life, he gratefully acknowledged his obligations both to the 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 the utmost importance to the business of his family. Before leaving England, he had already evinced considerable facility in acquiring knowledge of languages; and he had been but a short time abroad when he sent 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 in the prosecution of his business by the sound 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 on soon after; and he spent much of his time in acquiring a familiar acquaintance with its language and literature. A residence of a year at Paderborn was sufficient for this purpose. Under the influence of his perception of a taste not confined to 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 that his son had an imagination too lively, 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 from the prospect of a regular income, the high distinction in letters, induced him to forego the strict accomplishment of his favourite project, and to put no restrictions to the youth's inclinations. The time of young Taylor was the period of the war, and his gratitude to those who had contributed to the periodicals, and to translations from the best German writers.

When the French revolution had convulsed the Continent of Europe, it extended its influence over no small proportion of the English nation; of this influence the mind of Taylor was adaptable to see the force, and he soon became ambitious to add to his other distinctions that of being prominent in a political character. The quiet of the study was now exchanged for the noisy meetings of political debaters.

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 limits of his school. In his last works he attempts a poetic translation of the "Lenore" of Bürger was the first publication by which he became generally known. This translation, which preceded that of Spencer, still moves on the stage, being still regarded in this country as containing 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 time 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 poetic translations from the same source, composed by other English and German poets, by him, also appeared in various magazines and periodicals. Those he afterwards collected together, with explanatory observations, and published in 1830, in three large volumes, under the title, "Survey of German Poetry." The peculiar metre to which he has adapted many of these translations, and a honesty 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 his life of him he describes his first interview with Sir James Mackintosh and Dr. Parr; and vividly, though not perhaps impartially, delineates their manner and conversation (l. p. 296).

Southey, who was employed 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 devote all his time to literary pursuits. He was not only a diligent scholar, but a lover of poetry. His Specimens of Specimens of English Poets, 4th ed. 1813, was written to give a complete and correct view of the English literature of the period. His talents as a poet were unequal to the task of producing such a translation as the Wallenstein of Goethe, or the Faust of Lessing, to whom he devoted himself, and yet he is a poet, and that, unless a new or an original spirit is infused by the translator himself, there will remain nothing but a "caput mortuorum." The best translators of poetry therefore have been those who have blended their own original composition. (Tytler's Essay on the Principles of Translation, p. 873.) Those remarks will account for the chief and almost exclusive interest which Taylor takes in the lives and works of past and present English writers, and the Memoir of the Life and Writings of the late William Taylor of Norwich, &c., by T. W. Robertbs, F.G.S., of Norwich, 2 vols. 8vo., London, 1843; Quarterly Review, vol. III., p. 27-68.)

TECO'MA (from Tecomaxochil, the Mexican name of the species), a genus of plants belonging to the natural order Bignoniaceae. It has a campaspe 5-toothed calyx, a short-tubed corolla with a campaspe throat, and a 5-lobed biliate limb, four dasyoomous stamens with a sterile filament of a fifth, a bilamellate stigma, a siliceous-fringed 3-celled capsule having the sepals septum contrary to the valves; the seeds are purple-winged, disposed as the apressed stamens, in the axils of several bracts or scendent plants, with unequally pinnate or digitate simple leaves with terminal pinnules yellow or flesh-coloured flowers. They are natives of the Old and New World in the most tropical and sub-tropical regions. They are all elegant plants and well worthy of cultivation.

T. radicans is a climbing glabrous plant with rough rooting branches, 9 ovate acuminate osceol serrated leaflets, the racemes of flowers from the terminal and axillary leaf axils, the corolla 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. This plant has been a great favourite in this country. It thrives on sandy soil, usually 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. stana* is a small tree with somewhat tetragonal glabrous branches; ovate-lanceolate, acuminate serrate 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.

Several other species of *Tecona* have reputed medicinal virtues. *T. speciosum* is said to be a useful diuretic, also a cathartic. *T. impetiginosa* and *T. Ipex* contain large quantities of tannin, and decoctions of the bark are used by the Brahmans for the treatment of ulcers and a gargoyle in ulcers of the throat. The leaves are milder and are employed in affections of the eyes. In cultivation the species of *Tecona* 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.**

TRODAZILLIA (named after Robert Trosdale, author of a catalogue of plants growing about Castle Howard), a genus of plants belonging to the natural order Cruciferae and the sub-order Angustiseptae. It has a roundish notched pod, boat-shaped valves, their backs keeled below, narrowly winged above; the seeds two in each cell; the petals either equal or the two outer ones larger. The species are annual, with short smooth herbs with stalked expanded vertical leaves. The flowerv when white, *T. nudicaulis* is the *T. Beris* of De Candolle. It has unequal petals and numerous leaves spreading on the ground. The stamens have a considerable number within, the pouch emarginated and curved, the arrivals 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 are sown on rockwork or in dry sandy places they will scatter themselves and increase rapidly.

**Don, 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 had 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 interesting. In the sequel we have endeavoured to trace briefly the history of the remarkable series of 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, and have shewn how the various forms in which it is now presented 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 connection.

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 receiving end; and finally, the instant, in 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 investigations of 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 scientific museum, this part justly claimed an undoubted precedence. Later, the additions to the principle to purposes of general utility, arose the necessity for an equal, nay, almost for a greater degree of attention to the two former requisites. We shall see, in our brief retrospect of the history of this invention, how this fact developed itself.

The experiments of Dr. Watson and others, about the middle of the last century, and the humorous display of electrical phenomena which Franklin mentions as 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 instance of any attempt to reduce this idea to practice, appears to have been the experiments of Mr. Faraday, where, however, of the simplest possible construction. He employed, as an indicator, a pair of pit-balls; which were suspended from one end of a insulated wire, and caused to move by the operator taking his station, provided with an electrical machine. On charging the wire with electricity, the pit-balls would exercise mutual repulsion, and diverge from one another; then, by discharging the electric depôts, or by the contact of some conductor, the balls would collapse. It is evident that certain numbers of successive divergences might be made to denote particular preconcerted signals.

To account for this, 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 space. When this is done, the points of the figures are luminous for an instant, and leaps 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 with one of a discrete series of wires, there would be a combination of letters, visible in a darkened room, by passing an electrical charge through the appropriate wire. This in fact constituted the Telegram of Reizter, invented in 1745.

A scheme that simplified the former 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 a spark to 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 appears to have been made. One or two points present themselves for our consideration, before proceeding to the later periods of our history.

In reference to the extensive adaptability of the electricity derived from the ordinary machine, and that from the Voltaic battery, to the purposes of electric telegraphs, we may add that the progress of wonderful experiments has fast advanced to such a degree that the identity of the force in both machines, we have shown that in operating with the electrical machine or the Voltaic battery, we are dealing with the same powerful agent, only under different forms, homogeneous or Electrical electricity presents with phenomena which indicate its high degree of tension. It possesses the power of passing visibly in the form of a spark, through a greater or less space, when present in small quantity, so that a slight break in the conductor is not sufficient to prevent its passage. The Voltaic current, on the contrary, unless its intensity be elevated to a high degree, is unable thus to leap across more than a very minute interval. The researches of Mr. W. Cooke, a professor of electricity, to the nearest state of insulation, in the wire destined to convey the former, than is requisite in the conductor for the latter. When, therefore, the extension of these conductors over many miles of country is attempted by him, he has endeavored to the readers, that the impediments to the use of the former current were and are almost insuperable, from the difficulty of maintaining through so great a length, the requisite degree of tension, for safety, there would be provided that the uniformity of the conductor be insured and its capacity be sufficient, a much less perfect insulation will suffice. Another point to which it appears desirable to allude here, is the action of the current of electricity in the human body, is a fact well known, that with respect to the Leyden jar, the shock caused by the passage of the electricity through the body is not experienced, until the circuit between the outside and inside coatings of the jar is completed, by touching them both as
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 our knuckle to the conductor of an electrical machine, and take a cork from it, the zone 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 prime conductor and the earth, from which the circuit is delivered. Platinum inverts the idea of a conductor not in constant supply. It draws its constant supply. To extend this same principle farther, if we conceive two wires extended parallel to one another, to any length, and put a cork at their two ends; a Vitali 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 sufficiently good connection be made to conduct them, and that conducted 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 instant point, by an apparatus fitted for such indications, 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 journeyings 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 this is in every exercise 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 apparatus of decomposition of 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 transmitted. At each end to the wire a brass strip, arranged in a frame side by side, but 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 ebulition 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 of letters. If the letters be considered as the 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 upper letter of the pair. The operator then, if he would bear this rule in view in making his connection with the battery.

In 1815, Mr. Ronalds* of Ramhurst, invented an electric telegraph, in which he rendered the electric fluid the vehicle of intelligence. 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 pith-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 electric fluid more rapid and easy. A single wire perfectly insulated by being suspended from alken strings, or buried in glass tubes, surrounded by pitch, and protected by wooden troughs, was extended between the two stations. From the end of this wire were suspended in front of the dial of a clock a pair of pith-balls, so that while the wire was charged the balls would remain divergent, but would instantly collapse, when the wire by contact with the 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 the pith-balls at the farther extremity, consequently in a state of repulsion, would at the instant of this operation see the 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 to the same rate of going, carried, instead of the ordinary seconds hand, light discs, on which the various letters of the alphabet, the figures, and other required signals were engraved. These discs turned with a regular step; through a screen of metal, in which was made a small opening, in order to view the part of the disc where the signal was being seen. As the discs turned round, each letter in succession would be visible through this space; and it is evident that if the clock indicated by the same signal visible, the movement of the discs would be of a regular view at the same time. One of these instruments was situated at each end of the communicating wire. The operator who was about to transmit, once having watched the dial 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 would then warn the observer to note the letter visible on his instrument, which would form part of the intelligence to be received. The successive letters or signals constituting any message were denoted in this manner as the clock dials 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 connected beforehand with the use of different kinds of wire 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 the lawn of his house, and were so managed and operated as to satisfy the attention of the most fastidious inquired by them. But before we proceed to come to the construction and action of the Dry Pile or column of Mr. Ronalds, it may be specified that it consists of many hundreds, or even thousands, of small discs of silver and zinc foil, piled up in regular order, 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 the tubes. The ordinary length of a cylinder of electrical fluid 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 discovery, which he used to indicate the presence of electrical charge; in consequence of which it was repelled by this boll, and attracted by the other. These actions, though very feeble, are long continued, and might suffice to maintain a movement of a very light globe, as the opticn's 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 centre, 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 within a short time after Volta's discovery, Professor Schweigger 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 is commonly known in England as the Galvanometer, wherein the deflection has been of the most signal importance. Thus, in 1818, M. Ramd son, at Munich, and M. Brevard at Verona, had each constructed an Electric machine, which received motion from a Dry Pile. 

* Ronalds' Description of an Electric Telegraph, ex., p. 49. Translated from the BntisheiJodn-Mazar, September 25, 1818. In the same work (page 97) Mr. Ronalds, opining the option of Joseph, mentions that the profits of the invention were divided between Mr. Ronalds at Munich, and M. Brevard at Verona, who had each constructed an Electric clock, which received motion from a Dry Pile. 

** Mr. Ronalds, in his work on electricity, published in 1828, 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 Loc's Pile. Having once been set in motion, the pendulum would continue to oscillate between the balls, receiving at the end of each vibration a shock or impulse, from the attraction of the balls, 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 pellae, one on either side of the wheel. To many of our readers the construction and action of the Dry Pile or column of De Loc 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 order, 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 the tubes. The ordinary length of a cylinder of electrical fluid 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 discovery, which he used to indicate the presence of electrical charge; in consequence of which it was repelled by this boll, and attracted by the other. These actions, though very feeble, are long continued, and might suffice to maintain a movement of a very light globe, as the opticn's 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.
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 strong current, this discovery for the first time reveals the hostility of the Electric Telegraph, which has spread so extensively over England.

Very shortly after this important discovery had been made, Oersted, 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 could be magnetised perfectly soft, the magnets so produced lost their magnetic properties 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 galvanic current was composed with carbon, its magnetic power became to a greater or less extent permanent in it. These two principles have, since their discovery, formed the groundwork 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 hereafter bound the indefinite growth of men of science, or that no further progress can be made. Much has already been done, but far more, as yet latent and unknown, may be before us.

M. Ampère suggested the employment of the discovery of Oersted in 1830, and this suggestion was accepted by Professor Ritchie, in a model telegraph exhibited by him at the Royal Institution. M. Ampère’s plan however was far from possessing the simplicity, so essential in an instrument for so extensive a purpose. Not less than thirty pairs of conducting wires were necessary, according to his scheme, for maintaining a Telegraphic communication. M. Schilling also in 1832, following the idea originated by M. 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, by the completion or breaking of the galvanic circuit with its wires, denoted the required 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 one end of all the coils was joined for the several distinct return wires existing in the previous invention of M. Schilling. At a later period this latter gentleman undertook a series of experiments, with a view to the establishment of a communication by means of a single wire; but some mechanical difficulties appear to have been experienced, and consequently the experiment was given up before the death, which occurred while he was engaged in the prosecution of his investigations. In both of these telegraphs all that was requisite, in addition to the indicating apparatus and conducting wire, was a battery of accumulators, by means of which 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 wire was joined to a plate of metal, or to the 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 trough. The current would then flow along the conducting wire, around the multiplier-cord 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 the aid of which the operator of a telegraph can find the exact points of the circuit at the other end where the current is applied.

In a telegraph as advanced as the invention of M.M. Gosselin and Weber, the varied deflections of a single needle appear to have formed the code of signals. From the use of a single telegraphic needle, however, so remote a point as the different signals, it is to be inferred that the indications wanted precision and distinctness.

In June, 1837, the experiments of Meeks, Cooke and Wheatstone, which were begun for preening for more than a twelvemonth, appeared so far successful as to induce them to apply for a patent for their inventions. The principal points of novelty in this patent were the use of a much smaller number of needles, together with the employment of the temporary magnetism excited by the current in soft iron, to ring an alarm, either directly or indirectly, by the means of suitable machinery; and the reciprocal arrangement by which the invention was rendered practically 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 date of the patent, consisted of 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 the respective pole of the battery to its distant instrument, while the leads of 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 placed in each of these magnets, so that the current would pass in opposite directions around their coils, and consequently that the deflections must be in contrary directions. The needles would therefore converge, either above or below their line of centres, as one or other of the pair of keys belonging to each wire was depressed. Fixed stops were so 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 lines were drawn diverging from the centre of each axis, mutually converging, another pair of needles was placed at the point of intersection, at each of which was a letter or signal. Any of these letters could be indicated by the simultaneous movement of two needles, so that a communication might be rendered between the opposite ends of the line. The sending of one signal at the same time a plan was recognised, by which the number of wires requisite for maintaining a communication might be reduced, by using one of them as a return wire only, where before there would have been required a pair of wires. Thus, a 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

*Tesla's Lectures on Heat and Electricity, p. 912.

† In this and other parts of this article, where, according to the transmission of the telegraphic currents through a conductor, it is necessary, in order to simplify the description of the electric telegraph, to describe the connecting arm from one end of the pole of the battery, and, returning after its circuit to the other. Theory however, we are not prepared for the position of the element as it appears to have been developed at once at both ends of the battery, than to any power acting in one direction only.

* It appears desirable here to add a few words explanatory of the actual origin of the Electric Telegraph. Mr. Cooke at first had his attention directed to the subject in consequence of some experiments of Professor Wheatstone, in which he had the good fortune to witness. Thoroughly impressed with the possibility of the oft-attempted scheme of employing Electricity in the conveyance of information, the inventor was seized with the idea of its application to telegraphic purposes. In the early part of 1837, after having been engaged nearly a twelvemonth in the construction of various Telegraphic instruments, and in efforts to bring them into use on some of our Northern Railways, Mr. Cooke became acquainted with the experiments of Professor Wheatstone, whose experiments were directed to the same subject, and whose experiments and researches in electricity were in the highest degree correct and important. The public attention was also given by the joint names of those two gentlemen, as several which succeeded at extreme intervals. The relative connections of Mr. Cooke and Professor Wheatstone, with this invention, to the success of which both have contributed, are expressed in the following passage with which this note may be appropriately concluded:—While Mr. Cooke is happy to be enabled to acknowledge the assistance he had the honour of receiving from Professor Wheatstone, in this part of his invention, to the success of which both have contributed, he cannot forbear expressing his acknowledgments to the many others whose assistance he has received in having practically introduced and carried out the Electric Telegraph, as a useful undertaking, and Professor Wheatstone is acknowledged as the scientific patron, whose name will ever be prominently connected, as having first led to it, and to the manufacture of it, as an instrument of utility and science which would attract the rapid progress which this important invention has made in so short a time were associated.
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 resound by chemicals, over the line in tremors 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 intervention or announcement of position.

The bell or alarm which was to be rung, when the attention of the clerk at the distant terminal was required, was either direct or indirect in its action. In the first case the bell was a fine iron bar, arranged in a line, which had been rendered temporarily magnetic by the galvanic current, and was made to attract an armature, likewise of soft iron, towards it, and by this action kept a small hammer against 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 intervention of a scape-wheel and pallets, rang the bell in the manner well known in common alarms.

In the early part of 1835 Mr. Cooke obtained a patent for some further improvements of this apparatus. Of these the most prominent was the mode of introducing 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 by which any intermediate point might be introduced between the two terminals, and all intelligence rendered simultaneously visible in all or in any of them, as required. Furthermore any one of these instruments could be used for conveying a single相比于 drive, or ribbon, or any other 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 part. Thus if, while 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 extended side, the ringing of the bell at the originating station would 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 isolating the wires, which were to be laid beneath the earth, in tubors or troughs of wood, iron, earthenware, or other materials; 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 (1836) Messrs. Cooke and Wheatstone obtained a patent for their telegraphic apparatus, which were first put into operation upon the Great Western Railway, where its capabilities were tested severely. The result of this trial were most gratifying to the inventors, and demonstrated that the undertaking, yr...
The telegraph 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 from its lightness. The same arrangements were 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 side; and another arm, vertically under the first, rotated in a vertical axis, with the same side against the paper. 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 second point, as 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 used, by depressing which with the finger the first needle might be raised; the first necessary 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 in practice, the second, in which all depended on the second selection 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 there 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 Steinheil'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 steered in a solution of iodide 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 analogous to that of the needle and fixed stops in Dr. Steinheil'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 deflected, by moving the 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 one of a series of pistons, the whole of which, in their respective movements, were connected at equal distances around a light drum. The edges of these rings being 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 signaling, Davy ingeniously connected the two parts of the apparatus together, by such means that the transmission of each signal 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 electric circuit 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. The ribbon itself was divided into spaces by knives placed on the cylinder. The metallic cylinder was turned, and the edge of each platinum ring pressed upon the fabric, in the centre between two longitudinal lines, while the space through which the cylinder turned, at each release, corresponded to one tooth of the cylinder or one division of the small spaces, were brought in turn under each ring, as the ribbon passed onwards, receiving the registrations as it moved. If we now suppose one of the supplementary battery to be connected with a metallic cylinder bearing the needle, 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 a pair, the second needle of the same wire 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, as the needle was deflected by the current, the pole of the metallic cylinder would be attracted, and consequently the edge of the platinum ring would be turned, 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 a 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 spare wire or by ground, or be employed 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 or more rings would occur. The principle is to multiply 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 magnetization of soft iron by the electric current. The object of the invention was to produce, by excitation and demagnetization of the magnetic needle, places of soft iron, certain determinate 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 which maintains the latter state of the iron, is a thin 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 revolved on 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 second part of the apparatus is produced by 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, so as to produce by the movements of the roll with spokes or arms radiating around its upper surface; the telegraph which is operated upon by this Communicator, possesses great simplicity both in its principle and construction. One of the spokes is provided at equal distances with a 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 remanent magnetism of the iron causes, and a small reatting spring throws the armature back to its original position. The magnetism thus being inverted, an armature is attracted to it, but on interrupting the galvanic circuit the remanent magnetism of the iron causes, and a small reatting spring throws the armature back to its original position. The armature itself turns on an axis, which carries a pair of pallets, taking into the teeth of an escavement-wheel. In the instrument first constructed accorded with the requirements of the attraction and release of the armature actually formed the motive power of the machinery, the two pallets alternately moving the escavement-wheel onward, one tooth at a time. For this arrangement another was afterward substituted, in which a common spring barrel and fuse were employed to turn the escavement-wheel, and the pallets, actuated as above, merely controlled its revolutions like the same parts in a common escapement. In this case the object was the same, that of communicating to a light paper or micro dial, bearing letters around its circumference, a step by step motion, wholly under the control of the operator at a distant station; so that he might be able to transmit letters or telegraphic signs, in a manner as 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 Communicator previously described. Supposing for instance that the letter A were
opposite to the fixed stop in the Communicato, and that the same letter was visible through the opening in the screen of the tape; if the telegraph was then removed, the Communicator rested on an ivory division of its circumference, no current would then flow from the battery. But if the Communicator was then removed to the fixed stop, the spring would rest on a brass division of the circumference, and the current would flow freely through the circuit and the coil of the electro-magnet. The armature being then excited to a uniform motion to the point corresponding to a line on the escape-wheels, 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, and cause it to swing on the escape-wheel with the same velocity as before; and would let go, bringing round C also on the telegraph. In this manner by turning the Communicator round steadily with the finger, until any required letter came opposite to the fixed mark or stop, the same letter could be brought into view on the telegraph dial. A momentary pause would then be made, before continuing the movement to another signal, so as to enable the observer to note each letter in succession as it appeared. The same plan was obviously applicable to causing the rotation of a hand or index around a fixed dial, so as to point to any required letters or signals, one after the other. It is indeed unimportant whether a dial be made to move or lose its screen having an opening in it, or, the dial being fixed, a hand travel round so as to indicate any requisite letters upon it. In this, as in the needle instrument, the communicating stations would have a mutual and reciprocal action from the same source, and another arrangement another very marked advantage arises. The operator sees upon his own dial or instrument the signals which he makes upon his correspondent's apparatus; so that he is once aware of any accidental errors in signalling, and is prepared to rectify it forthwith. Still further to reduce the chance of an error, each word as it is completed is acknowledged by the recipient by a single preconcerted signal, before the next word is commenced. This telegraph requires only a single wire for its use, the return of the current being provided by the earth.

The essential principle forming the basis of this invention presented themselves to Professor Wheatstone. Of these we will describe two of the most prominent. It is evident that if the operator were to move the communicating part of the apparatus, step by step, in accordance with the beats of a clock pendulum, a hand upon the telegraph at the distant station would rotate exactly as if attached to the clock, and show precisely the same time. But that the clock itself might be made to do this same duty, and thus telegraph its own time to any number of distant stations, was an idea which did not long fail to occur to the inventor. This was effected simply by attaching a small common pendulum to the axis of the telegraph clock; a spring being placed so as to make and break the circuit, as the divisions of the disc passed under it. These electric clocks were either constructed so as to derive the motive power from the action of the arms, or in the form of electro-magnetic telegraph first alluded to; or the movements of the armatures were employed only to control the power of an ordinary spring or weight. It is evident that any number of secondary ‘telegraph clocks’ might thus, if connected by a single wire, receive their motion from one governing chronometer at a central point. In addition of Professor Wheatstone's a form for regulating all the clocks of the metropolis, by means of wires passing under the streets, and connecting the subordinate instruments with one central chronometer, an eminent artist aptly remarked, that ‘he proposed to lay on Time through the streets of London, as we now lay on water.’

The second application above mentioned to which Professor Wheatstone turned his attention, immediately after having completed the details of the electro-magnetic telegraph, is that of enabling the machine to print its intelligence, instead of rendering it visibly, or to do both at the same time. To effect this it was only necessary to replace the necessary portion of the light metallic disc, cut in radiating lines so as to form a circle of delicate springs. On each of these, instead of a visible character only, was placed a small type. The type-disc was then made to rotate, precisely as the model uniform move of the machine, carrying a sheet of paper covered with white paper; there being interposed between the type and the cylinder, a sheet of the copying or transfer paper well known as the Carbonic ink paper. Any requisite

type could therefore, by the same action which brought the various letters into view in the signal telegraph, be placed in the proper position on a sheet of paper, as in the case of the printing telegraph. The tube of the cylinder. Immediately that any one was so placed, a small hammer, acting by a train of wheel-work precisely similar to the striking train in a clock, struck the end of the type, and by means of the impulses of blow, pressed the letter on the cylinder. The succeeding signals were similarly impressed, one after the other. The train giving forward motion to the paper, the letters would pass in succession over the armature which moved the type-disc; and by an arrange-ment sufficiently obvious, this train was made, after each impres-sion of a letter, to move the paper cylinder round through the same distance as before. This 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 unworked, to be placed 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 however some very 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 electricity. It was proposed by the inventors to employ the electro-magnetic circuit to turn the pendulum of a clock, at the end of its oscillations, in the following manner:—An electro-magnetic coil formed the base of the pendulum, having its ends so placed as to come very near to the ends 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 way that the end of the coil then nearest to the magnet on the side to which the pendulum had oscillated, was momentarily ended with the same polar force as the magnets themselves. The result was a renewal of the current in the coil and magnet, and the former, being free to move, receded 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 completed by the primary merely through the galvanic current, a return 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 a signal. 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 particularize, 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 effected by the movement forward of the entire type-wheel and its axis, by a crank and connecting gear in the printing train. This head of the machine would be struck down by the printing-hammer, in impressing a signal.

The second principle is that of the use of two clocks at the two communicating stations, to rotate the type-wheels with uniform motion, both cylinders revolving exactly at 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
action of this part 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 constantly being traced on a cylinder, which was secretly defended in his own instrument, and therefore, if the clocks go accurately together, in a similar position in his correspondent's instrument.

At the same time this hand, by coming 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 prevents its printing the signal behind it. 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 front passed 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, and in the case, the bar magnet would be attracted towards one coil, while at the same time it would be repelled by the other. These actions tended to carry the magnet to the same side, as far as the spring to which it was attached allowed it to move. Thus the circuit would be broken, or reversed, by the current inverted the effects of the coils, and the magnet would then pass to the other side.

The combinations of these two movements represented the various letters and words, being denoted by 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 act 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 the one plate to the other. Indeed the current might be presumed to conduct with a rapidity superior to that obtained with a similar instrument connected with a battery, as above described, may be regarded merely as a battery of one pair of plates, separated by a very wide interval of exciting material, represented by the earth. It was at first supposed by Mr. Bain that this instrument would be applicable to telegraphic purposes, but subsequent experiments showed that it was available only for a few miles of distance; its intensity being insufficient to enable it to travel through any great length of wire. The same reason applied to the magnetism, the intensity of which in this case was expected to be fonder, requiring the earth battery would become very useful and important. In the original 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 stations, so that their insulation from one another, and from the earth, might be maintained by being current, 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 coming in actual contact with any part of the supporting standard. The insulation was mainly of porcelain wires, and earthwire. The standards were usually fixed at from forty to sixty yards asunder, and at each quarter of a mile a stouter post was placed, to bear the winding or straining apparatus.

This was a simple winding-reel, connected with a machine-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 only supported the wire, without reference to winding or straining, but merely to keep it steady. 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 conducting wires, the cost of construction of an electric telegraph was reduced nearly one-half. 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 impossible to prevent their being in any way exposed. But when the tubes were removed from the earth, and placed in the open air, they were more liable to receive injuries, for they could be damaged by being run over by carts, or in various other ways.

But while the tubes were in use, it was necessary to supply at almost each quarter of a mile along the line, a proving or testing post, where the commanding officer could then be sent 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 electric current obtained from the apparatus, or every error or fault discovered with considerable accuracy.

Still with all these appliances, the detection and repair of any derangement of the wires demanded considerable skill, and left the operator exposed to danger at any point; but when the wires were far in sight, and any fault or iatrogen to be discovered, and was easily and quickly repaired. But having traced the invention through a few of its most remarkable stages, up to the time when it assumed the form it at present retains in England, we may add a few words on the mode 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 where these partitions occurred were termed Division Stations, and might be regarded as junctions, or points of junction, of the various portions of the line. At the same time a general system of telegraph connected all the divisions with each other, and with the actual terminus of the line, so as to bind the whole of the railway together into one large system of telegraph, and correspondence between the most distant points. Each station possessed a wire of its own, extending from one to the other terminus of its division, and including at every station a battery of two or more needles; a current of any number of 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 the other stations in the same division. All the movements were made by a needle visible by the corresponding needle at all the stations, and as all information respecting the arrival or departure of trains, state of the line, accidents, and impediments, were immediately conveyed from stations to stations by this means, 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 railway. The working of the railway was left to the agents of the line to decide.

Although the plan of executing the conducting wires in tubes beneath the ground, when put in practice on a large scale, presents many difficulties, it is generally held that the introduction of such a system of telegraph will be attended with very great advantage, and will render unnecessary some improvements in the method of insulating and protecting the wires, it is thought it is not so easy to produce a general commercial system throughout England.

It is to be understood that the statements we have made are to include the whole of our previous experiments with each battery see 'Electrical Magazine', pp. 277, 287.
be assumed or inferred, all was evident and visible, and in fact, in the words of Mr. Cook, the clerk at every 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 also small wires 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, that not only accurately and justly all Mr. Cook's measures were planned beforehand.

* The Blackwall has absolutely depended 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 telegraphio system is different, i.e., as much as its peculiar locomotive plan, the stations do not require any communication between themselves, but only with the two terminals.

Even on railways possessing a double line of rails, so complete a means of information as that described in reference to the Yarmouth 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 instruments 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 useless expense would be a powerful cause to adoption. In order therefore to meet the requirements of the railway in so economical a mode as possible, a modified system has been adopted. The same plan of divisions and of telegraphs, or rather telegraphy, which is adopted in the line, needles are dispensed with, and merely the ordinary telegraph retained at the subordinate stations. Usually the instrument possesses two needles and requiring two wires, is preferred for both the general and the sectional 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 the conditions are either of frequent occurrence or of 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 mechanical telegraph (as it is called in contradistinction to the electric), was either of Professor Wheatstone's or Professor Cooke's invention; the former being adopted; the needle-instrument, from the great rapidity with which messages can be sent, and from other causes, having obtained the preference. It will however become very valuable, both as a means of working a permanent line, and also in some cases for the transmission of political or commercial intelligence, where secrecy is required. It is now in use in France, 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 applied to the needle instrument, but is peculiarly so to the electro-magnetic telegraph; while at the same time a permanent and unalterable source of electric power is substituted for the galvanic battery. Although for telegraphic purposes these two instruments differ more than is generally supposed, their operations are singularly constant in their action, yet this is a most important advantage, owing as it does all necessity for change or renewal of the source of electric power.

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, Syston and Peterboro', Newcastle and Berwick, North British, Hull and Bradford, &c.

**TELEB-RISBUTH,** [TRELLAS] (P. C.)

**TEMPOPLEURUS.** Some fossil echinoids of the Suffolk crog are referred to this genus by Mr. S. V. Wood.

**TEMPERATURE OF THE SEA.** [SEA] (P. C.)

**TENT, MILITARY,** is a temporary dwelling-place made of canvas, which is supported by one pole, or more, and stretched by means of cords, which are made fast to pickets driven into the ground: tents are set up when an army is encamped in the field either for actual service or for the purpose of performing military exercises.

The tents of the private soldiers, whether infantry or cavalry, are of a conical form with circular bases, the supporting pole or standard of each being planted vertically in the ground, in the centre: the standard is 10 feet 8 inches long, and the whole diameter of the tent, between two opposite pickets, is 17 feet 3 inches; but from the lower extremity of the cone, about 2 feet from the ground, the canvas hangs down vertically and forms a cylindrical shell, therefore the diameter of the tent within the canvas is 13 feet 8 inches. Fifteen infantry, or twelve cavalry soldiers occupy such a tent. The round tent of an officer is 12 feet 6 inches in diameter within the walls. The marquees of officers, as well as the hospital and laboratory tents, are of oblong form on the plan, and in these, the canvas is supported by two standards, which are connected together at their tops by what is called a ridge pole 6 or 7 feet long. The length of an officer's marquee is 19 feet, and the breadth 18 feet, both dimensions being taken within the walls: tents of the two other kinds are still greater.

For the rules of modernod courier, or the dispositions of tents in an encampment, see Encampment, P. C.

**TENTACULITUS** is a beautifully formed group of small annulated pointed shells, fossil in the Silurian strata.

They have been recently referred by Mr. Salter to the Annona. (Reports of British Association for 1845.)

**TENTORII,** CRISTOFORO, born in 1745, in Spain, of a Venetian family, studied first in his native country, and afterwards removed to Venice, where he spent the greater part of his life. He is known chiefly for his historical works concerning Venice. He published, in 1765, his first work, 'Storia Civile e Politica della Repubblica di
VENETIA, con una Descrizione Corografica e Topografica de’ suoi Stati, Venice, 12 vols, 8vo. This was the first condemned history of Venice, being a kind of abridgment of the most usual histories of the republic, and especially of Sandi’s ‘Storia Civile e Politica,’ with the important addition of a topographical and statistical description of all the dominions of Venice. Tentori’s second work is a continuation of the first, being a full account of the destruction of the republic of Venice by the French in 1797: ‘Raccolta Cronologico-Ragionata di Documenti inediti che formano la Storia Diplomatica della Rivoluzione e Caduta di Venezia, di Adriano Cricchi, conservatori,’ 2 vols, 4to, 1799, published without the author’s name from prudential motives. Tentori consulted the secret state archives when they were first opened to the public after the fall of the old government, and there he found full evidence of the iniquitous arts by which the catastrophe had been effected. He gives the text of the documents in order of time, and accompanies them with a brief narrative of the events. The perusal of this work is absolutely necessary to form a correct idea of those transactions, and to counteract the erroneous impression produced by the garbled accounts published in France and in Italy; among the rest by an anonymous contemporary work entitled ‘Storia degli ultimi Ottocento anni della Repubblica,’ which was falsely attributed to Tentori himself. [VENICE, REPUBLIC OF, P. C.]

Tentori wrote about the same time an elaborate investigation of the history of the famous connection of Balmont Tlepo and the two Querni in 1809, which had been ignorantly asserted by the modern democrats of Venice to have been a movement in favor of popular liberty, whilst in reality it was the fruit of the tyranny of dispossessed patriots against their own order, and for the purpose of supplanting their personal enemy, the Doge Grazianos: ‘IL VERO CARATORE POLITICO DI BALSAMON TIPOLU, DIMOSTRATO DALLA VERSI COMPOSIZIONE DEGLI SAGGI VENETI ED ESTERI,’ Venice, 1789. The other works of Tentori are:—Della Legislazione Veneziana sulla Prescrizione delle Larghe, 8vo, Venice, 1792; ‘Dialogo sulla Regolazione del Fiume Brenta, con una Appendice di Riduzioni sopra il medesimo, corredata di una Carta Idrografica,’ Venice, 1790; ‘Errata-corrige sulle Memorie Venete del Gallicioli; ‘Osservazioni sulle Memorie eddette, Venice, 1797. Gallicioli was a contemporary compiler of Venetian history.

Tentori lived and died poor. He filled in the latter years of his life the office of preceptor in the patrician family of Tlepo at Venice. As a native of Spain he was required by Napoleon’s police in 1808 to swear fidelity to the intrusive king Joseph, which having refused to do, he was kept under arrest for a long time, and his papers were inspected by them at Bozen in 1810 at the country residence of the Tlepo family, at Carbonera.

(Tipaldi, Biografia degli Italiani Illustri; Moschini, Del Levante Veneziense.)

TERATOCRITHEUS, a fossil fish from Sheppoy. (König.)

TEREBELLARIA, a genus of fossil Milliporiae from the Bath oolite rocks. (Lamouroux.)

TEREBIA TYPHUS. This genus has been divided, according to the suggestion of Phillips (‘Paleozoic Fossil of Devon’), into Ephithria and Hypothyria. (Morris.)

TERENTIUS CLEMENS, a Roman jurist, whose period is uncertain, but he lived after Justinus, or was at least a contemporary, for he cites him. (Dig., 24, 6, 5, 8.) He wrote two books ‘Ad Legem Julianum et Papiam,’ from which there are some excerpts in the Digest. He is not cited by name in the Digest.

TERMS, ATTENDANT AND SATISFIED. As the assignment of satisfied terms on the purchase of property was frequently accompanied by great difficulty and expense, it was deemed advisable to remedy this increasing evil. In the 8 & 9 Vict. an act was passed intituled ‘An Act to render the assignment of Satisfied Terms unnecessary.’ It provided that every satisfied term on the 31st December, 1845, attendant upon the inheritance, should on that day cease, except that such term, although made to cease, should afford the same protection as if the same still subsisted, but had not been dealt with after the 31st December, 1845. And, by s. 2, that all subsequent terms, after created, and any not subsisting when the above was passed, should, on becoming satisfied after the day mentioned above, and which should after that day become attendant on the inheritance, should immediately on becoming so become attendant and determine.

The benefit of these provisions will be seen by referring toVenetian Possessions. Bengal Presidency, 320,000, 47,000. North-west Provinces, 100,000, 20,000. Madras Presidency, 140,000, 40,000. Bombay Presidency, 70,000, 8,500. Sind, 70,000, 1,500.

Independent States. 700,000, 92,000.

Hyderabad (The Nizam), 95,000, 9,400. Berar, or Nagpur (Raja), 85,000, 9,000. Mysore (Raja), 27,000, 3,500. Gwalior and Malwa (Raja), 34,000, 4,000. Gugarat, &c. (The Guisevar), 25,000, 2,000. Oud (Kine), 20,000, 2,000. Lahore, or Panjub (Raja), 60,000, 3,000. Cashmere States (Raja), 20,000, 1,000. Sirk Hill States (Chief), 20,000, 1,000. Bundelkund States (Chief), 8,000, 1,200. Rewah (Raja), 7,000, 600. Bhoop (Raja), 6,000, 500. Indore (Raja), 8,000, 600. Ooster (Raja), 8,000, 600. Dhar (Raja), 600. Sattara (Raja), 8,000, 1,500. Colpoor (Raja), 8,000, 1,000. Jummunhurkud (Raja), 1,000, 1,000. Bhyrpoor (Raja), 2,000, 500. Trevancore (Raja), 5,000, 2,500. Cochin (Raja), 1,500, 200. Wickli (Raja), 2,000, 200. Bikaner (Raja), 1,400, 800. Bahualpoor, 12,000. Jeesalmeer, 9,000. Joulpur (Marwar), 25,000. Jeypoor, 14,000. Ooidpoor, or Mewar, 10,000, 10,000. Cutch (Rao), 7,000. Shirpur, 5,000. Kotah, 4,000. Boondee, 2,000. Dholpoor, Tonk, &c., 2,000.

Independent States. 500,000, 46,000. Nepal (Raja), 45,000, 1,500. Bhutan, 25,000, 500. 70,000, 2,000. British Possessions. 92,000, 46,000. Dependent States. 500,000, 46,000. Independent States. 70,000, 2,000.
The Bengal Presidency comprises the provinces of Bengal, Bahar, Benares, Allahabad, Oorans, Cuttack, Guundwa, the Ceded Districts on the Nerbudda, and the British territory east of the Ganges to the frontiers of Birma.

The Madras Presidency comprises the territory of the late Agra Presidency, which was established by an Act, 3 & 4 Wm. IV. c. 85 (August, 1833), but suspended by a subsequent Act, 5 & 6 Wm. IV. c. 92 (August, 1836), 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 him, and the extent of the authority to be exercised by him. The North-West Provinces extend east and north as to include the Delhi Doab, and the countries to the west and north of the Deli Doab; and probably include also the Jullundur Doab and hill-country connected with it, which is added to in our Table.

The Madras Presidency comprises the Northern Circars, the whole of the Carnatic, and extends westward across the peninsula so as to include all the British territory (Malabar, Canara, &c.) south and west of Myore.

The Bombay Presidency comprises all the British territory on the west side of Hindostan, from Canara northward, the Coopee, South Mahratta country, Deccan, Candelas, Surat, &c., and the islands of Hors and Quilon. The Bombay Presidency will probably be made to include Sinde, which was annexed to the British territory in March, 1845, and is yet (1846) under a separate governor.

The late conquests of the Lahore presidency on the east banks of the Ganges and Sutlege, and the Jullundur Doab, between the Beas and the Sutlege, with a considerable portion of hill-country which extends east-north-eastwards into the north of the Indus. By the treaty of peace with the Maharaja of Lahore, the British assume the control, in respect to tolls and ferries, of the Beas and Sutlege, the Ganges, and the Punjab to the confluence of the Indus and Ghulmutkaw, and the control of the Indus from Ghulmutkaw to the borders of Beluchistan.

The Madras Presidency is divided into Collectories for purposes of revenue and administration, but accounts are not published of the extent and revenues of the Collectories severally. 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:—

<table>
<thead>
<tr>
<th>Presidency</th>
<th>Total Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bengal</td>
<td>£4,729,500</td>
</tr>
<tr>
<td>North-West Provinces</td>
<td>4,195,438</td>
</tr>
<tr>
<td>Madras Presidency</td>
<td>3,601,996</td>
</tr>
<tr>
<td>Total</td>
<td>£12,777,534</td>
</tr>
</tbody>
</table>

Receipts from assets in England and China

| Total Revenue in England | £15,068,843 |
| Total revenue in England | 2,944,073 |
| Total sales in England | 18,012,916 |

Deficiency

| Deficiency | £2,849,128 |

The total amount of the public debts of the Presidencies, on the 30th of April, 1844, was £7,359,829, bearing annual interest amounting to £1,731,092.

British India, strictly speaking, comprises only the territory which is actually in the possession of the British government, but the whole of Hindostan, from the Indus to the frontiers of Birma, with the exception of Bengal and Oostindien, is under British suzerainty and control, and in fact forms one great political body, of which the British government is the head. Some of the Ootukudai, and other Collectories, are tributary, some are feudatory, and some are restricted, according to the circumstances and treaties under which they became dependent. The new Casmere state is feudatory. Ghohal Sing is to give to the British government annually 10,000, twan (a male and female), and three pairs of Cashmere shawls, as an acknowledgment of the supremacy of the British government. The government of Lahore is left independent, and the same annual tribute, limited by the new treaty to 25 battalions of infantry, consisting of 800 booyats each, and 15,000 cavalry. If a larger army should be necessary in any emergency, it may be increased by the British government; and the limits of the Lahore territory are not to be changed without a similar 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 Damaun; the French, Pondicherry, Madav, and Carwali. Serampore and Tranquebar have been recently purchased by the British government from the Danes.

The circumstances which led to the annexation of Sind to the British territory are stated in the article S Kardash, P.C.S.C.

The late ruler of the Punjab, Ranjeet Sing, always remained on terms of amity with the British government in India, and had not only extended his territories, but also collected before the British government had been seriously seriously engaged in the Punjab. He was succeeded by his son, who having died, and the present Maharaja, Dhuleep Sing, who succeeded, being very young, his mother the Ranock was declared the successor of the latter, and became the head of the army, and in order to extricate themselves from the dangers to which they were constantly exposed from the violence of the soldiers, secretly gave its sanction to the leaders of the Sikh troops in making an attack on the British frontier. The Sikh army began to cross the Sutlege, Dec. 11, 1845, and, after investing Ferozepore on one side, took up an entrenched position at the village of Ferozepubah, about ten miles in advance of Ferozepore, and about the same distance from the village of Moodoke. 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 Umbalick to the relief of Ferozepore, which had been attacked without provocation or declaration of hostilities. The British army, under Sir Hugh Gough, mounted on the 23rd December, in face of a rapid march of 150 miles, reached Moodkee, Dec. 18, and on the evening of the same day repulsed an attack of the Sikh army and captured 17 guns. On the following day the army was concentrated at Moodkee, and the Sikh army moved towards Ferozepore; and having on the march formed a junction with Major-General Sir John Littler, who had with him 5000 men and 21 guns, Sir Hugh Gough ordered the army in order of battle, and attacked the enemy's intrenchment of camp, and on the evening of Dec. 21 captured 74 pieces of cannon, took possession of the camp, with large quantities of ammunition and warlike stores, and compelled the Sikhs to retire to the Sutlege. The British force on this occasion consisted of 16,700 men, and 69 guns, chiefiy horse artillery. The Sikh forces were variously estimated at from 48,000 to 60,000 men, with 105 pieces of cannon of large calibres and fixed batteries. Sir Henry Dundie, governor-general of India, was engaged in this battle as second in command. The total killed of the British was 644, the total wounded 1721; in all 2415. The British took 21 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 baggage formed a junction with the troops at Loodiana, who were in a forbidding body of the enemy's troops, the Sikh army then retreated, and took up an intrenched position at Budawal, from which they were also compelled to retreat down the Sutlege, but having been reinforced by about 10,000 regular troops, taken up a strong position, and a large force of cavalry, from the right bank, the British advanced towards the British forces in order to intercept their communication with the main army, intimating themselves near the village of Alwai. The Sikh camp was carried by storm on the 25th of January, 1846, the whole of the enemy's cannon and munitions of war captured, and his army driven headlong across the Sutlege 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 Alwai was Sir William Willoughby, and the chief having on the same day been reinforced by Sir Harry Smith with the victorious army of Alwai, the attack on the Sikhs was made on the 10th of February. The enemy's camp, strongly intrenched, defended by 36,000 men, and 57
pieces of artillery of large calibre, with a considerable camp
and some artillery on the opposite bank of the river, was
stormed by the British army under Sir Hugh Gough, and
after two hours of desperate resistance on the part of the
Siaks, they were driven into and across the river with
immense loss, 67 guns having been captured by the British.
Sir Hugh Gough's success, however, suffered from the effects of
the fall, was also in this battle. The loss of the enemy is
supposed to have been from 8000 to 10,000 men. The loss of
the British was 320 killed, 2063 wounded; in all 2383.

The next day the British army retreated from the west
bank of the river, having been defeated in every action,
with the loss of a vast number of men and 220 pieces of
field artillery. The British army crossed the Sutlej, occupying
near the Maharaja Duleep Singh, his heirs and successors, on the other,
was concluded at Lahore, March 9, 1846. A similar
was concluded with the Maharaja Ghobal Singh at Umritsar,
or Umrit, March 16, 1846.

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 5000l.,
the annuity of 3000l. being paid to the next surviving
body of each of who may succeed to the respective titles; but
the Court of Directors of the East India Company having
granted to Sir Henry Hardinge an annuity for life of 5000l.,
paid by the East India Company, and the East India
Company, it was enacted that the government annuity of 3000l.
should not be paid to Viscount Hardinge till after the annuity
of 5000l. terminates; and an annuity for life of 2000l. having
been given to the Maharaja Duleep Singh on the 9th
of March 1846, the East India Company having paid
the Maharaja Duleep Singh, his heirs and successors,

(Parliamentary Papers, Map, &c.)

TERTULLIANUS, Jurist. [Tertullianus, P. C.]

TERWESTEN, AUGUSTYN, was born at the Hague
in 1649. He became at about twenty years of age the pupil of
N. Wieling and W. Dousdus; 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
resided till his death, by his historical compositions, sacred and profane, but his favourite author
was Ovid. He restored the Academy of the Hague, which
did not come to a very inefficient state; and in 1690 he was
invited by the Elector of Brandenburg, afterwards King of
Prussia, to 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 possessed with remarkable rapidity and freedom;
there are a few etchings by him.

(Houbrechen, Groote Schoonhurk der Konst Schilders, &c.)

TESBSED PAVEMENTS. [Tiles and Pavements, P. C.]

TEST ACT. [Boroughs, &c., P. C., p. 202.]

TESTE OF A WRIT. [Writt, P. C.]

TESTELIN or TETTELIN, LOUIS, was born at Paris
in 1646. He was the son of N. Wieling. 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
1646. His presentation picture was an historical portrait of
Louis XIV. He was appointed one of the professors of the
academy. Testelin's picture of the Resurrection of
Tabitha by St. Paul, painted in 1632, is considered one of the
master-pieces of the French school of painting, and is com-
pared with the celebrated picture by Rembrandt, the Burning of the Books at Ephesus; it is in the church
of Notre Dame; there is a print of it by Bosse and Picard to
Remain. There is also another celebrated picture by Testelin
in the church of Notre Dame deduced by the name of the
Sisters of St. Louis de la Charité, the same St. Louis who
was painted in 1656, 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 age of 41, he was, in the east Indies, Sir Hugh Gough, and
Brun and Testelin were great friends. Testelin had great
theoretical knowledge, and he and Le Brun frequently con-
sidered on the principles of art. Testelin never was in Italy,
like Sir Hugh Gough, but he was a great admirer of comparative merit of the Roman and Venetian schools, taking
their abstract characterising as their subject, Roman design, and
Venetian colour and light and shade, Le Brun advo-
cating the grand style and French, added by a genius for
arguing 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 masters than you are.

(D'Argenville, Abrége de la Vie des Peintres, &c.)

TETRAGONOLEPIS, a remarkable and numerous genus of
fossil gastropod fishes, chiefly from the lim strata of Dorset-
shire. [Agassiz.]

TETRANTHERA, a genus of plants belonging to the
natural order Lauraceae. The flowers are dioecious, some
hermaphrodite, involucrated. The calyx 6-parted, the seg-
ments nearly equal or wanting. The fertile stamens generally
about 9, in the petaloid flower from 12 to 21. The leaves
are variable, with pinnate veins.

T. ROZBYRUPHIS is a variable plant, a native of the mountains
of India and Ceylon. The leaves are elliptical, with the
base, smooth and shining above, more or less downy
beneath. The umbel rather compound and nearly white.
The fruit is globose, black, and about the size of a pea, yielding
a kind of fruiting powder 'the female part of the plant being
cut and dried. These seeds are a good quality candle, and which serves as a basis for
salves. This fixed oil is supposed to contain the principal
part of the fruit of Parcs gentianae, so much esteemed in the
East Indies under the name of A vondel Pea.

(Lindley, Vegetable Kingdom; Lindley, Flora Medica.)

TETRAODON. [Germkobutus, P. C. B.]

TETRAPRUS, a genus of fossil fishes from the Cre-
taceous and Tertiary strata. [Agassiz.]

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 land. 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 conceded 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 con-
federation of the Mexican States. It was established as a
state August 15, 1824, and the State Constitution was pro-
mulged in March, 1827.

In 1835 there was an open and undeclared war between the Mexican troops and the American settlers occurred. This was followed by various
conflicts; and at last the independence of the country was
proclaimed, when Stephen Austin advised that no limits of the territory must be marked, and that the field should be
left open to extend beyond the Rio Grande to Chihuahua
and New Mexico.

On the 2nd of March, 1836, a declaration of independence
was issued; and, on the 17th, a constitution was proclaimed, on
the model of those of the southern states of North
America. The law of slavery, which Mexico had abolished,
was re-instituted—the legislature was the power to enunci-
ate slaves—the presence in the country of free coloured
persons was interdicted, and the privileges of citizenship
were denied to all Africans, and the descendants of Africans and Indians.

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
prisoner by General Houston. This event terminated all Mexican
authorities in Texas.

In 1837 the Committee of Foreign Affairs at Washington
reported to the House, that the independence of Texas ought
to be recognised. This recommendation was laid upon the
President of the Senate of Congress of the United States; and
the President of General Jackson, an amendment to the
General Appropriation Bill was carried, for the payment of
the outfit and salary of a diplomatic agent to Texas when
the President of the Senate of Congress of the United States
was a independent power. Immediately after this bill was

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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 liquification 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 occurrence 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 liquification of this the disunion is complete.

THESES. 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 Thesee. We now supply the omission.

On the site and amongst the ruins of the ancient city of Thebes stand four principal villages, Carna or Luxor on the eastern bank of the Nile, Geurnon and Medinet-Ahun on the western bank. At Luxor, near the river, are the remains of a temple, the entrance to which is through a magnificent propylon, or gateway, consisting of two pyramidal masse, the

A severe and long-continued frost abstracts so much caloric from terrestrial bodies, as the walls of buildings which are not

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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 recognized by the United States. To have effected this recognition by treaty, a majority of two-thirds of the Senate would have been required, but 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, which was ratified at Austin in Feb., 1841. This treaty was made with 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 independence by this country, the nomination of Texas in 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—narrating incursions were common, and the government had not necessary 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. Seeing that this did not happen, public opinion began to favor intervention by 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 Coahuila, and was settled by the Spaniards as early as 1605. 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 Massachusetts, 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 liquation 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 more rapidly by those which have the greatest power of conducting caloric; 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 caloric which it is continually removed from it and conveyed 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 Alexandria on March 25, 1833. The smaller obelisk was selected as not only lighter, but in a better state of preservation than the larger. This obelisk was found to have been placed on a higher pedestal than the other, and somewhat more forward, so as to make the difference of size less observable 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 pedestal behind 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, 3180 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 unburnt bricks about 8500 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, which some have thought to be a temple and some a palace (it may have been both) is 1856 feet in length, 360 feet in its greatest width, and 321 feet in its least width. The entrance to it (the western entrance) fronts the Nile, with which it is connected by an alley of columns, the tops of which are formed of a lion and a human head (a ram). This alley conducts to a propylon, without sculpture, 360 feet long and 145 feet high, with a great doorway in the centre 64 feet high; passing through which a large colonnade forms a range of pillars on the sides, and a double row of slabs on pillars down the middle, which terminate opposite two colossal statues in front of a second propylon. A flight of twenty-seven steps then leads to the entrance hall, which has been called the Great Portico of the House of Carnac. It is 338 feet by 1704 feet, and comprises an area of 37,629 square feet. The roof, which is flat, and when perfect was formed of very large slabs of stone, is supported on the columns of the arcade, which are about 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 propylon, pillars, and walls are covered with sculptures. Four beautiful obelisks form the entrance from the hall to the adyta, or sacred place, which consists of three apartments, all of granite, and the sacred room, or sanctuary, is adorned with rich sculptures, and paintings and gilding. Beyond the adytum are porticoes and galleries, which were probably continued to another propylon at the eastern end.

The adytum consists in front of them, 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 entrance on the north side.

Painting Knowledge,' 'Egyptian Antiquities,' vol. i., 'Penny Magazine,' 1837.

THEOTOCPFALI, DOMINICO, called El Greco, was painter, sculptor, and architect. He is said to have been the scholar of Titian. In 1577 he was residing in Toledo, where he appears to have settled, from his name and his surname of El Greco, the Greek, he was doubtless a native of Greece. He painted many pictures in Toledo, and acquired a great reputation in Spain. El Greco made the marble decorations of the altar (retablo), and the altarpiece of the Parting of Christ’s Raiment before the Crucifixion, for the old sacristy of the cathedral of Toledo, which was occupied from 1577 until 1687, when he was paid for the whole work 319,600 maravedis, of which 119,000 were for the picture; about 100,000, altogether, but owing to the change in the value of Spanish money it is perhaps impossible to calculate the sum accurately. He was however not engaged exclusively on this work all this time; he painted other works in the meanwhile, and for Philip II. an altarpiece of the Martyrdom of St. Maurice for the cathedral, which he never had the opportunity of completing. It is now in the chapel of the college; a picture by Romulo Casarrubios was substituted for it over the altar of the chapel of St. Maurice’s in the Escorial. The study of these pictures was the main hardness of colour and extravagance of design which El Greco is said to have introduced to prevent the picture being mistaken for a work of Titian, which it seems had been the fate of some of his best paintings.

As an architect he designed the Cua del Ayuntamiento or mansion-house, of Toledo, and the churches of La Caridad and of the convent of the bare-footed Franciscans at Illlescas; and he designed also the whole of the paintings and sculptures of these churches. In 1590 he designed the church of the Augustines at Madrid, called de Donna Maria de Aragon, and painted the principal altarpiece of their college. He designed also several monuments, which are among his best works. He died at Toledo in 1652, 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 more numerous at the end of the last century; Cean Bermudez enumerates a great many in Toledo, Illlescas, Escalona, Bayona, in Segovia, La Guardia, Mostoles, Casarrubios, Siguenza, Medina Celis, Valencia, Leon, at the Royal Palace in Madrid, and in many other places. Many have 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 Sacrificia 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 Gonzalo 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, that it is the true spirit of the Spanish school, and of its adoption. The burial of the Conde de Orgaz was painted in 1584 for the archbishop of Toledo, Cardinal Don Gaspar de Quiroga, for the great sum of 2000 ducats according to Cumberland. In the churches of St. Maria la Real and St. Augustine convent of San Estevan at Toledo, and this picture was painted in honour of the foundation—the saints Augustine and Stephen are represented deposing the crown in his hand, and the picture contains the portraits of many distinguished persons of the time.

His son, George Manuel Thotococufali, was also a sculptor and architect of eminence. He was appointed painter and architect to the King of Spain, and died in Madrid while he was on a journey to Paris, and he died at Toledo in 1631. He was the architect of the ceanav of the church 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 Bermudez, 'Diccionario Historico,' &c.; Cumberland, 'Anecdotes of Eminent Painters in Spain.'

THILOBUS, a fossil fish from the upper Siurian strata of Lodlow. (Murchison.)

THEONOA, a genus of fossil Zeolitha from the secondary and tertiary strata. (Lamouroux.)

THIBAULTIUS JUSTUS BRIEDEKIND, a celebrated German jurist, was born on the 4th of January, 1772, at Hameln in Hanover. In 1792 he went to Göttingen to study the law; he continued his studies at Königsberg; and he finally settled at Kiel, where he was also acquainted with Niebuhr. 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 to the same capacity to Jena, where he published his 'System des Pandekten-Rechts,' 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 foreign members of the commission of legislation for Russia, in 1812. In 1823 he was made professor of the university of Heidelberg, where he remained till his death. Though scarcely passed thirty, he was considered to be the first civilist in Germany after Hugo, Savigny having not yet attained his great reputation. Twice Thibaut was the principal, or professor 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 first chamber of the States of Baden, but as he now resided in Poznan, he resigned the office. In 1826 he was made a privy councillor. His fame and his popularity among the students led to his receiving invitations from other universities, as for instance from Leipzig, where the then professor of philosophy informed 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 dominion of Baden. In 1818 he was chosen Meister corresponding à l'Académie des Sciences, Moralphilosophie, et Politiques, for the section of legislation and jurisprudence. Thibaut died on the 28th of March, 1840, with the well-deserved reputation of being equal to Savigny as a civilian, and superior to him as a teacher and 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 practical use. In his private life Thibaut was most amiable: to many a poor scholar 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; but he showed particular attention to those who, beyond the ordinary means of knowledge, had the means 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 respect.

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 since the author's death, by Professor Buchholz, Jena, 1846. This work is in the hands of nine out of the 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 publications: 1. 'De principiis jure divisio Pretio,' 1768, 8vo., a dissertation inaugural which brought the young honours of being attacked by Hugo. 2. 'Jurisprudentia exequipolitica et methodoligica,' 2 vols., 1789, 8vo., the 'Einzelne Theile der Theorie des Rechts.' ('Essays on several Branches of the Theory of the Law'), Jena, 1788-1802, 2 vols. 2nd edit., 1817, translated into French by De San dit et De Chassaing, Paris, 1811. 4. 'Rechts Besitz und Verjüngung' (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. 5. 'Besitz und Verjüngung,' 3 vols., 1814, 4th edit., 1822. 6. 'Ueber Reinheit der Tonks.' (On Purity of Music), Heidelberg, 1825, 8vo.; 2nd edit., 1826. 7. 'Ueber die Nothwendigkeit und Nützlichkeit des Gesetzes,' 2 vols., 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. Almost German laws and a large portion of the Roman law exist there together, the former referring principally to landed property, entails estates and others called 'noble estates,' the latter to the public law of the Empire, and the personal law, in 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, furlough, marriage and testamentary custom. Among its contracts, the common succession to personal property and to land, except entails 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, Hamburgh, and Lübeck deserve a particular attention, especially the law of Lübeck. The Roman-German code is not only presented in the form of a code, but is the common law of nearly all the towns of North-Eastern Germany as well as those in the adjacent provinces of Eastern Prussia and the so-called German provinces of Russia. In the twenty years of the time of the 'Rhineinlandstatistik' in 1796, the French code became the common law in the Rhineland provinces and in the grand-duchy of Baden.

This sketch, however imperfect, may be sufficient to show that the government of Austria, though but little, is not in the least interferent; 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 partly still are, so many courts of justice before which cases need to be brought, that no one could expect more regular or more practical instruction, especially in historical learning, than is generally possessed by the members of the common courts of justice. Thibaut's proposal was to fashion this legal chaos into a general code, as was done in France; and although he admitted that the task would be very difficult, he maintained that what had been done in France would diminish the difficulty. His plan became soon popular, but he also met with decided adversaries, among whom Savigny took the lead, who contended that Germany was not yet ripe for 'a common legislation; that the idea itself was good, but that there were so many scientific (rather theoretical) differences among the jurists concerning 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 Germany, is yet considered to be a failure: he avoided speaking 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 eventually which cannot but take place, however soon 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 books. He was the founder of the 'Civilistisches Archiv' and the 'Heidelberger Jahrbücher.'

(Den Gadeus's Dictionary; Babington, Manual of British Botany.)

THORVALESEN, BERTEL (Albert), was born November 19, 1770, at Copenhagen. He was the son of Gottschalk Thorvaldsen, a carver in wood, and his wife Karen Grønfeldt, the daughter of a priest of Jutland. Gottschalk was a native of Iceland, and was in very poor circumstances when his son Bertel was born. Bertel and his father in his work at a very early age, and when only eleven 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 acquire a considerable knowledge of his art, and to undertake to execute the head-pieces of ships. At the age of seventeen he obtained the silver medal of the academy, for a law-relief of Cupid reposing; and in 1791, when he was only twenty years of age, he presented a sketch of Helliodorus driven from the temple. Two years later he obtained the principal gold medal of the academy, and with it the privilege of studying for three years abroad at the public expense under his father's direction. He devoted a year or two to preliminary general study, for scholarship was not one of his acquirements, and he had much
to read and much to learn. On the 20th of May, 1796, he set out for Italy in the Danish frigate Theis, and he arrived at Naples in the end of January of the following year, in the packet-boat from Palermo. The Theis cruised in the North Sea until September; but the Danish government then allowed a period of quarantine at Malta, made a voyage to Tripoli to protect Danish commerce, and performed quarantine a second time at Malta, when Thorwaldsen left it in a small sailing boat for Palermo, where he took the packet-boat to Naples.

At Naples, wholly unaccustomed to the Italian language, and for the first time entirely separated from his own countrymen, 28-year-old Thorwaldsen's heart failed him, and he longed to 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 crew 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 approve with, and he will never succeed in his industry.' Alas! during this time Zoega was right, except in the last particular. Thorwaldsen was industrious, but faddish, and often destroyed what he had cost him much labour. This was the fate of a deeply-reflecting mind which he had to 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 not the least difficult Zoega, with whom Thorwaldsen was about to return to Denmark; and Canova exclaimed, 'This work of the young Dane is in a new and a grand style.'

By the assistance of a Danish lady, Frederica Brun, who gave him the necessary funds, which he did not, and that 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 carriage of the vetturino, one of his commissions, the Danish sculptor Hanges, found 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 Owans upon the statues of Jason, of Copenhagen were repeated in the artistic circles of Rome, and echoed by the professional dilettanti of the place. One of these dilettanti took Mr. Hope in the year 1803 to the studio of Thorwaldsen, to see the statue with which he had praised. The English connoisseur stood long before the plaster figure, then inquired what Thorwaldsen required for a marble copy of it: ' 600 ducats,' was the answer; 'You shall have it,' said the sculptor, without waiting his reply of assent.

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 him a pressng 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 commission upon commission rendered it impossible; he could not leave the capital city.

During this busy time Thorwaldsen recreated himself in the summer seasons at Leghorn, in the beautiful villa of Baron Schubart, the Danish 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, happened to sit next to Thorwaldsen at one of the tables in the Catholic church of St. Luko, and asked him if he could get ready a plaster fresco for one of the large apartments of the Quirinal Palace, in three months. Thorwaldsen undertook the commission, and in three months the plaster sketch, a celebrated bas-relief of the Triumph of Alexander was completed. The immediate subject was Alexander's triumphal entry into Babylon: 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 1813, Thorwaldsen and his friend the artist at Algiers, took a voyage to the islands of Cythera and the Paphos, and 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 splendid triumph and his termination of term was 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 received 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 monuments to Copeninors, Pins VII, Maximilian of Bavaria, the Pontiatiok monument, and others. In 1823 he had a narrow escape of his life: a boy, the son of his landlord, contrived to get hold of one of Thorwaldsen's pistols, which was discharged in his hand, but with a good heart, and afterwards he continued his art with the same success. In 1825 he was appointed to the post of Frigate Capt. of 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 finally left them to engage his services in the service of the Baron Stampil, where a studio was built for him; and he finished here some of his last works—the frieze of the Process to Gogolofa, for the cathedral; the entrance into Jerusalem, for Copenhagen; and the busts of the poet Oehlenschlager and Holberg.

In 1841, finding the climate disagreeable with him, he felt compelled to return to Italy, and he executed at this time his group of the Graces for the King of Wurtemberg. He returned however to Denmark and Nyso in the following year, and executed two other works, bas-reliefs, which are among his last productions—Christ's Joy in Heaven; and the Genius of Poetry, which he presented to his friend Oehlenschlager. He intended to return to Rome in the summer of 1844, but he died suddenly in the theatre of Copenhagen, on March 24th, in that year, aged seventy-three: he was buried in the Church of Christianshavn, and the Danish government sent the frieze Rota to carry them and their sculptor to Copenhagen. Thorwaldsen's will bears much resemblance to Sir F. Chantrey's will: he left 60,000 dollars to the Danish National Museum, including casts of his own works, to the city of Copenhagen, to form a district 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. Beside casts of 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, vases, engraved gems, cameos, terracottas, bronzes, medals, cameos, engravings, prints of all descriptions, books on the 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 their mother Madame Poulsen, his natural daughter, to descend to her children, the whole remainder of his estate is to be converted into capital, and to be added to the 25,000 dollars already presented for the purpose by Thorwaldsen, to form a museum perpetual fund, for the preservation of the French National Art, for the encouragement of Danish art, and to add to the collections of the museum. His daughter, now a widow, resides in Rome, where she was born. Thorwaldsen's will is to be completed by Professor Bissen, of the Academy of Copenhagen, and he is superintendent or keeper of the Thorwaldsen Museum; the
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government is with five trustees, two are always to be pro-
fessors of the Academy, one a magistrate of Copenhagen, and
one a sculptor, and one a lawyer. Thorwaldson, himself a
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 is ten.

Thorwaldson 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 monotonity, though many individual
figures are bold, solid, and of beautiful proportions. His
 beau-ideal appears to have been something between the An-
cient Greek and the Christian type. Degasmet called him a
Grecian; 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 Thorwaldson 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 well as of the master of Grecian sculpture. Bagophanes
customarily was a favourite style with Thorwaldson, 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 whole of this group is somewhat cold-blooded. The
Church of the Bois de Boulogne was an occasion to Golgotha,
which is the frieze of the cathedral church of Copenhagen,
immediately below the numerous group of John preaching in the Wilderness,
in full relief, in the red marble; in the same building, the four great Prophets;
Christ and the Twelve Apostles are above and around the
altar. The Triumph of Alexander, of which there is a copy in
marble in the palace of Christianstadb (the first marble copy
was executed by Canova, and is now in the Villa Farnese in
the Lake of Ceno), is a long triumphal procession in two
divisions, one meeting the other. In the centre, Alexander,
in the chariot of Victory, and followed by his army, is met by the goddess
of Peace, followed by Mazzocchi and Bagophanes with presents
for the conqueror. The subject is taken from the work of
Quintus Curtius. Much of the frieze is symbolical; per-
spective is nowhere introduced. The whole arrangement is
beautiful, especially that portion which comes from Babylon,
comprising the General Mazzocchi with his family; female
figures strewing flowers; Bagophanes placing silver altars
with burning incense, musicians, and attendants leading horses,
archers and military, and other various figures; but the
next to these are symbolic representations of the river
Euphrates, and the peacefull occupations of the Babylonians. The
human figures of this work are admirable, as is also the
marble which has been selected. The general mediocrity both in design and modelling, especially that of Alexander himself, Bucephalus, which is led following
the chariot of Alexander; it is a complete distortion. None
of the horses of Thorwaldson are successful. The colossal
animal of the Poniatowski monument at Warsaw, and that
of (smaller proportions) of the monument to Maximilian of Bavaria
at Munich, are heavy and graceless, and wanting in the finer
characteristics of form which belong to the horse. The works
of Thorwaldson do not display extraordinary power or fertility
of invention - Flaxman's distinguishing faculty. Flaxman's
outlines belong not less to the province of sculpture from the
circumstances of their not having been executed in marble;
most of them are designed and well adapted for basso-
relievo.

Many years ago some admirers of Lord Byron raised a sub-
scription for a monument to the poet, to be placed in West-
minster Abbey. Christmas was requested to execute it, but
on account of the smallness of the sum subscribed, he declined,
and Thorwaldson was then applied to, and cheerfully under-
took the execution. In 1845, Thorwaldson was commissioned
to execute a monument at the custom-house in London, but, to the astonishment of the
subscribers, the Dean of Westminster, Dr. Ireland, declined
to give permission to have it set up in the Abbey, and owing
to this difficulty, which has proved insurmountable, for the
present decree that it shall not be executed. Since his decease,
it has remained for upwards of ten years in the custom-house,
and has recently (1854) been removed to the library of
Trinity College, Cambridge: it was previously taken to the
studio of Sir Richard Westmacott. The poet is represented
of the size of life, seated on a ruin, with his left foot resting
on the fragment of a column and his right hand holding a
style up to his mouth; in his left is a book, inscribed 'Childe
Harold,' he is dressed in a frock-coat and cloak. Beside
him on the left is a skull, above which is the Athenian owl.
The execution is not of the highest order; both figure and
bas-relief are arcquately modelled; thus fineness of expression is
precluded through want of elaboration. The likeness is of
course posthumous.

(II. C. Anderson, Bertel Thorwaldsen, eine biographische
Skizze. Aus dem Dönhnischen übertragen von Julius Reucher,
Kunsthblatt, 1844; Art-Union Journal, 1845.)

THRCINCIA, a genus of plants belonging to the natural
order Composita. The leaves are pointed, figure-shaped;
are sacculated; thus fineness of expression is pre-
cluded through want of elaboration. The likeness is of
course posthumous.

(THUNBERG's Hist. of Plants.)

THUYDIES, a genus of fowl coniferous plants from the
colloque of Stonesfield, Collyweston, Gristhorpe, and Solen-
hofen. (Bronnlaert.)

THYMUS, the subdivision of the genus SCOMBER
(Mackerel) to which the fish called the Tunny belongs.
The Tunnies 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 to the head. In the
thorax they have a corset of larger scales, a character which
is wanting in the subgenus Scopem. The Tunny and Bonito
are the best known examples. The former fish has nine
broad, continuous fins 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
face is black with a white border below; the head is white;
the belly is grey, with silver spots; the fins variously coloured;
the first dorsals, pectorals, and
ventrals are dusky; the tail is rather paler; the second
dorsal and anal more or less flesh-coloured, and the spiny
fins 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
'History of British Fishes':—

"In the months of May and June, when seeking a proper
situation near the shore upon which to deploy their spawn,
the adult fish rove along the coast in large schools and are
known to be extremely timid, easily induced to take a new
and apparently open course to avoid any suspected danger.
Advantage has been taken of these peculiarities to carry on
most extensive fishery against them at various places, which is
as valuable as it is destructive. Cutler and M. Valenciennes
have described the two most common modes of effecting their
capture. When the fish are provided with a long line
stretched a few yards in front of the boat, or held 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 tunnel to receive the fish, which is drawn towards the shore, bringing with it all the short boats. The carters carry the fish in great bunches, and small tans
in their arms; the larger are first killed with poles. This fishery, practised on the coast of Languedoc, sometimes yields many hundredweight at each sweep of the nets.

A peculiar form of taking tunnies is by the madrigue, or, as the Italians call it, tamboro. This is more complicated engine, and somehow expensive to set up. It consists of a series of long and deep nets fixed vertically by corks 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 in a zigzag manner opening on the land side. The tunnies, which in their progress proceed along the coast, pass between the tamboro; 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 tamboro 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, that 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 hurling them back, while the chosen enemies, which attracts a great number of curious people to witness it, is one of the great amusements of rich Sicilians, and at the same time one of the most considerable branches of the commerce of the island. When Louis de Lavradores, the celebrated English sailor, 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 profession, although he had spent it in the British Channel.

The tuna 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 (Scopner 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.

TICANUBA, a genus of insects, with six legs and podulous organs of motion on their sides, or, at the extremity of the abdomen. They undergo no metamorphosis. They have been grouped by Latreille under two families, of which Lepisma and Podura, two Linnæan genera, are the respective types. As we have a number of species of Indians, covered with small scales, which are used as tests for the powers of microscope glasses. They have long setaceous many-pointed antennæ, distinct palpi to the mouth, and movable false feet on the sides of the abdomen; the body is terminated by articulated acts, three of which are especially conspicuous. The Podurella have four-pointed antennæ, indistinct 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 Lepismana and Podurella 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 funel-shaped corolla with a long tube, and a 6-crested limb, either equal or unequal. The stamens are from 3 to 5, of which from 2 to 6 are often sterile. The disk is cup-shaped, surrounding the ovary; the stigma 5-lobed. T. jasminiflora is a shrub from seven to eight feet high, a native of Rio Janeiro. The leaves are vernace and stalked; the flowers are white and carmine, on the base, acuminate, obtuse, deep green with pellucid dots. The calyx is rather downy, the corolla white, downy, glandular with pellucid dots. A decoction of the leaves is dangerous for some diseases, and for those of the skin. T. pyriformis 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 foliaceous, and the style more prostrated. The
The Report is accompanied by Minutes of Evidence, an appendix of matters relating to the inquiry, and by plans of the rivers Clyde and Tay, Birmingham Harbour and the river Blyth, Harwich Harbour, and 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 general want of control over the management and revenue of 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 encroachments upon the public interests and work, now scarcely remedied, and of preventing the execution of works which it is now expedient to demolish.

The income of the various ports of the United Kingdom considerably exceeds 800,000l. a year, the whole of which is yielded 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 misappliance 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; the south coast from the Thames to the Solent; the coast of Northumberland, the Tyne, the Wear, the Tweed, the Tyne, Berwick, the Wear, Yarmouth, the Wash, Blackney, and the ports of the Island of Man; that in Ireland they have visited most of the ports and fishing-piers around the coast, and have been strongly impressed by the abuse of the public revenue, the inefficiency of the management, and the capacity, and the extent and capability of improvement of its fisheries, which, even in their present state, with the fishery-piers often in ruin from neglect, afford employment to cheap vessels and boats, and 30,000 hands, from door to door. 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; such as the mismanagement of the docks of Dublin, Waterford, Wexford, Cork, Limerick, Galway, Sligo, Londonderry, Belfast, Newry, Dundalk, and Drogheda. 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-piers. They cite as instances of neglect the injury done to Bantry Harbour, Skerries, and Larne, by discharging ballast and stones into them.

After advertizing to the necessity for additional lights and beacons on the Isle of Man, they proceed to animadvert on the rivers and harbours of England. On the north-west coast of England, they examine the River Mersey, the River Mersey, the River Ribble and port of Preston, the river Dee and port of Chester; on the south coast, Salcombe, Dartmouth, and Exeter; on the north-east coast, the river Tyne at Newcastle, the Wear at Sunderland, Hartlepool, Stockton-on-Tees, Whitby, Scarborough, Bridlington, Kingston-upon-Hull, Grimsby, Great Yarmouth, Norwich, Lowestoft, Decies on the Waveney, Bloxneky and Clew 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 4,000,000l., and that consequently one-fourth of the whole harbour-income of 800,000l. must be annually appropriated to pay the interest of this debt. This large sum, though borrowed with the sanction of the legislature, has been entirely laid out by the several local boards without the least parliamentary or other special control.

The Commissioners then animadvert on the obstruction and shows 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. They also urge the necessity of establishing a Board of Conservancy for the superintendence and control of the management of all the tide harbours of the United Kingdom. The proceedings of the Harbours of Refuge Commission are briefly stated under Refuge Harbour, of P. C. S. (Tidal Harbours Commission—First and Second Reports, 1844, 1846.)

TIDES. [Acceleration and Retardation of Tides, P. C. S.]

TIDES AND PAVEMENTS. The subject of tessellated pavements being already partially treated of under Mosaic, P. C. S., p. 247, the principal object of this article is to notice some recent improvements by which the revival of this elegant and durable kind of architectural decoration has been facilitated. In doing so we may refer our readers for fuller information to the literary portion of a beautifully illustrated thin folio volume published in 1842 by Mr. Blashfield, a gentleman who has done much for the promotion of this branch of art, under the title of 'Designs for Mosaic and Tessellated Pavements, by Owen Jones, architect; with an Essay on their Materials and Structure, by F. O. Ward;' or, for a pretty full popular notice of the subject of ornamental pavements generally, to the 'Pictorial Gallery of Arts,' vol. i. pp. 182, 183.

Decorated paving tiles of baked pottery, commonly called encaustic tiles, which were much used in the pavements of churches and other ecclesiastical buildings of early date, have been recently brought into use again with excellent effect in the Templo Church, London, and many other buildings; and improvements in their manufacture introduced by Messrs. Carey, Chamberlain, of Worcester, and Mr. Minton, of Stoke-upon-Trent, have, by the aid of great pressure, rendered them much harder and less porous than old tiles of the same character, and therefore even more durable. The process of making these tiles is called the 'Japanese method,' because the mosaic work, tessellated tiles, as practised at the Royal Porcelain Works at Worcester, is described by an eye-witness in No. 700 of the 'Penny Magazine,' from which we copy the following curious details: 'The clay, and, if need be, more, differently coloured clays, are imbodied in the other. The body of the tile, which is about an inch thick, is moulded in stiff clay, of the quality required to form the ground colour of the design which is to be printed on the tile: it is then baked, as before, in a mould which, in addition to giving the tile its required form, produces depressions about a quarter of an inch deep wherever another coloured clay is required; the process being repeated under pressure, and baked, in the same manner and screw. The second coloured clay, which, instead of being made stiff like the first, is mixed to about the consistency of honey, is then applied so as to fill all the depressions or cavities, it being carefully plastered in with a knife or trowel. Much care and skill are necessary in the selection of the clays, that they may be of such quality as to contract together in baking as if they were one, although they are of such different consistency when moulded. In order better to guard against injury from irregular shrinking, the tiles are laid aside for about eight weeks to dry slowly, after which the surface is scraped to remove all that may be superfluous of the softer or second clay. The tiles are next covered with bitumen and then baked, and they are then baked or burnt in a similar manner to porcelain. Like porcelain also, they may be subsequently coated upon the upper surface with a liquid glaze, which is afterwards fired; and vitrified, and the designs being afterwards engrailed or incised with a pointed tool, and the cavities are filled with another clay, which is then covered with another glaze, and the whole, so many times repeated, is imbedded in cement, and such holes or other cavities may be formed in their lower surface as will, by affording increased hold for the cement, render it almost impossible to disturb them from their bed.

Among other recently invented methods of imitating the antient Roman tessellated pavements, which are so called from being composed of small pieces termed tesserae or tessellae ('Tessera,' P. C. S., p. 246), Mr. Ward, in the Essay referred to, notices a patent obtained early in the present century, by Mr. C. Wyatt, for producing ornamental pavements by inlaying stone or coloured cement, with the further that these and pavements formed by a combination of cement with terracotta appear to have failed from the unequal hardness of the materials used. More recently, according to this writer, Mr. Blashfield has constructed second or pseudo-pavements very well for indoor purposes, though they would not bear exposure to weather, of cement moulded with metallic oxides; and, but with less success, he has tried bitumen coloured in like manner. In 1829 a patent was taken out by Alfred Snider and Henry Peter for a method of forming tesserae of pottery or porcelain by cutting them out of sheets of clay, and, after baking, combining them into slabs suitable for laying up in the form of Roman cement, of which a complete layer is formed at the back of the tessera. This plan has been followed, among other places, in a large pavement in the saloon of the Reform Club-house. Under ordinary circumstances it is proposed to
form the tesselate, 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 Mr. Proser, of Birmingham, obtained a patent for a method of producing a substance similar to, but very much harder and less porous than common porcelain, by subjecting a mixture of powdered felspar or flint and fine clay, in dry a state as possible, under great pressure between flat surfaces, 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 the mother-of-pearl; being, when well made, beautiful in appearance, and cheaper and far more durable than common buttons. Mr. Blashfield perceived the peculiar fitness of this process for making tesselate for pavements, and the manufacture has been commenced by Mr. Minton with every prospect of success. These compressed tesselae are made by a simple but powerful machine, which condenses the material to 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 explanatory 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 petroleum tesselae are impregnated 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 in size and shape, that when fitted together they unite much more perfectly than those used in ancient pavements, in which the beauty is often impaired by broad and irregular lines of cement. In constructing pavements with them, the tesserae are arranged, face downwardwards, 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. Such cemented slabs thus produced are laid down upon the prepared foundation in the same manner as already described in the case of Singer's plan. This mode of producing tessellated pavements possesses many advantages over the ancient plan, in which, a level foundation having been prepared by crumpling stones together, or forming a thick floor of succo 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 that as 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 Singer's plan, would have been entirely obviated by destroying their hard surface. Owing to the imperfect fitting of the ancient 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 larger articles may be produced, among which may be mentioned slabs, inlaid with coloured devices, for chimney-pieces and other architectural decorations.

An extensive collection of specimens of Roman tessellated pavements, in a very large atlas folio, published by William Fowler early in the present century, together with specimens of ancient 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 tesselae, that in some cases they have superseded the use of oil-cloth in the construction of the building, substitution being made on the score of economy, although sanctioned by a refined taste.

**TIMBER, PRESERVATION OF.** Whatever causes may combine to promote the decomposition of wood by fungus, whether the result of fermentation or of a mechanical process, it must be remembered that 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 damaging influences, and therefore that everything in promoting the durability of wood as it is in lessening the tendency to those changes of form and hue which so greatly increase the difficulties of the carpenter and joiner. The process usually consists in the exposure of the timber to the action of air in dry situations, ice, locks 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 of timber, until the sap or vegetable juices shall have been driven off, and the wood hardened, that the action of the microscopic fungi which constitute various kinds of rot, in order to the success of this operation it is important that the pile of timber be so far elevated from the ground as to allow the air to circulate freely around 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 would be likely to remain in any place. Great advantages have been derived from methods of heating the wood which has been reduced to thin boards and put into boxes, or even solid blocks, and afterwards introduced in our dockyards, in the stacking of timber upon elevated supports of iron or stone, and the building of ships beneath spacious roofs, which protect their timbers from rain, while they allow the air to circulate around them.

In the article House, pp. 53 and 54 of this volume, we have noticed a very simple, though not unimportant, improvement upon the common method of seasoning flooring-boards. Kiln- drying, and the expulsion of sap by charring or scoring 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, consists in the use of the fermentable juices, for the preservation of timber, by lengthened immersion in fresh or sea water, and subsequent drying. Immersion in sea-water especially has been extensively practised of late years; and it is stated that many splendid buildings of the ancient mariners have been preserved, some writers having attributed the durability of the materials to their use. In some cases, this treatment has arrested it, 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, are unhealthy in consequence of the hygroscopic 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 wood 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 different combinations of substances used in the "Mechanic's Magazine," vol. xxxix. pp. 340-350, extended from a report made in 1843 by a committee of the Franklin Institute, on the best method of paving highways; and in a previous number of the same work (p. 225) is a 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 there has none that attained such general celebrity as Mr. Kyran'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 chlorides 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 alumines of the wood, and converts it into a compound capable of resisting the ordinary chemical changes of vegetable matter. The idea of using corrosive sublimate for this purpose does not appear to have originated with Mr. Kyran; for the same 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 Kyranisation to timber when exposed to the action of sea-water, has led Sir William Henry, a Commissioner in the navy, to patent a method for preserving timber by impregnation with chloride of zinc, which process, like Kyran's, is also applicable to canvas, cordage, &c., and to which the name of Anti-Dry-Rot has been applied, and which is recommended the application of cresote, 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. Macconachie in 1803. He applied it by placing the tim-
ber on a frame, fanning it with air and fumes from the
pores of the timber by the admission and subsequent con-
densation of steam; and, after repeating this process as often
as needful, plunging the timber into the oil, which filled the
exhausted pores, hardening out the sap and gums, forcing
heated 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 creosote,
and remarks on the inutility of the process when it was
attempted for rendering insensible to water, or soluble in
water, or in alcohol; in animals it may be either soluble or insoluble in water. For the mode of obtaining it
see COSMOPOLITANS, P. C. S., p. 349. It is one of the substances
directly prepared from the union of 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 ingredient 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,
and gelatin. Ludlow in 1844, and Liebig in 1845, proposed
three names for the vegetable albumen, vegetable fibrin, and
gelatin, asserting that they are identical in their
physical properties and in their chemical compositions with
the corresponding principles in the animal kingdom. Multip-
le, however, the discoverer of these animal substances, denies the accuracy of this statement.
'The special character of these animal substances is,' he remarks, 'determined by the small portions of sulphur and phosphorus they contain, by which they differ from each other
and from pure protein. The proportions of sulphur and
phosphorus in the three vegetable substances are still unknown;
and therefore the names proposed by Liebig cannot be applied
wholly to both vegetable and animal substances.

Moreover, both vegetable and animal substances differ so much from animal fibrin and casein, both in form and appearance, that they ought not to have a similar name.' We
shall retain the former names, representing by leysin the
substance which is precipitated in white flakes, 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,
and, independently of the sulphur and phosphorus, has
nothing in common with the vegetable albumen of the
same composition. We have, however, for convenience,
chosen the term albumen we mean the compound of protein, sulphur, and
phosphorus which is insoluble in water; it exists in the
seeds of the cereals, in almonds, &c. By gelatin we understand
the substance which can exist either as a gelatinous

P. C. S., No. 165.
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 glutenine. Its composition according to Mulder is 
\[ (C_{66}H_{54}O_{34}) + S + 10 \text{Fr} + S_i \text{if we take Fr as an arbitrary symbol for protein;} \]
and sufficient to indicate that it consists of 10 parts of protein, one part of sulphur, and 18 parts of phosphorus.

It is a substance, which possesses the property of dissolving the protein-compounds, and the question whether Mulder or Enderlin be correct is still undecided.

A new alkaline solution of protein by an acid, its solubility is greatly diminished; a fact which Mulder regards as elucidating the properties of other substances. The sulphurous and phosphoric acids for instance possess the property of dissolving the blood corpuscles; and, on the contrary, by which protein is readily dissolved, is destitute of that property. Very dilute hydrochloric acid occurs in the stomach, but it possesses the property of dissolving protein, it is powerless the food (at least the portion consisting of protein-compounds) tender, and assists digestion. Some acids enter into combination with the protein-compounds, producing comparatively insoluble bodies. For this reason certain vegetable products, the asparagines are very efficaciously employed in putrid fevers, scurvy, &c. As an illustration of the combination of the protein-compounds with salts, we may notice that of bone-earth with casein. Bone-earth is a phosphat of lime, what bone-earth is represented by the formula 3 P O. + 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-wall 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 phosphat of lime, which thus finds its way to the bone.

Two other very important protein-compounds exist in the animal body, namely the albumin and trioseid 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 Sydenham Society, London 1845.) At every recovery of the small amount of them in the blood, and Mulder (who must be regarded as the highest in 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 and fibrin.

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 substance of plants. As the morphology of this substance has been fully discussed in the article Tissues, Vegetables, we shall confine our observations to the chemical characters and metamorphoses of this substance.

This cellular substance may be prepared from all the parts of plants without exception, by dissolving (by certain reagents) the other substances associated with it. Pure cellulose is easily obtained from the pith of the elder-tree, or from the stalks of some plants. It is a substance which is starch, gum, fats, resins, vegetable alkalises, salts, sugar, and the peculiar woody matter termed by Payen matière insatiable. After the removal of these substances by extracting with alcohol, ether, nitric acid, and water, the cellulose, which was previously solid and dens, 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, have similar results, viz. the ovula of almonds, of apples, of the Helianthus annuus, the sap of cucumbers, the tissue of the cucumber, the pith of the elder-tree, the pith of the Zelkovenose pellenus, cottonwood, the leaves of endive and of the Acanthus glandul.osus, the tracheen of the Mussa sapontum, films from the path of oak-trees, from Mulder's laboratory that sulphuric acid or dissolve will convert cellulose into dextrin. Hence the cellulose substance is closely allied to starch, dextrin, and amylose, and containing their products in the vegetable kingdom, and no doubt being itself produced from one of them, namely from dextrin. It is therefore of great importance to the animal body. It explains the nourishing power of those plants in which the incorporation of the cellulose is prevented by artificial means, as of Greeks, endive, sea-kale, &c. The cellulose of these plants, being easily converted into dextrin, may be reckoned amongst 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 proteins, to the first formation of vegetable matter; thus starches, gums, &c., which consist for the most part of cellulose. In many fruits containing a large proportion of cellulose, there is much sugar. These different substances may be produced from the same cellulose, simply by a change in its physical character and a new chemical arrangement of its constituents. On the other hand, we observe that fruits, from being sugary, become mealy when kept through the winter; this being a converse change of sugar into cellulose. Hence, as Mulder remarks, 'we may consider the cellular plants as consisting chiefly of cellulose and of protein-compounds; the vascular plants containing, in addition, the incrusting or real woody matter. In the same way that the cells of the animal kingdom consist of the composition of plants; they are found everywhere and in all their organs. Cellulose is to plants what gelatin is to animals; they form together the cells in these two kingdoms. In the cells is the principle of the animal proteins, and in the tissues the composition of plants. These are the indispensible constituents of plants; they are found everywhere and in all their organs.'
lead us to infer that cellulose can often be modified as it were into starch, though still retaining the appearance of cellular membrane. The similarity of the chemical constitution of the two substances renders their conversion apparently easy.

For 1 eq. cellulose (C_{6}H_{10}O_{5}) = 2 eq. starch (C_{6}H_{12}O_{6}) + 1 eq. water (H_{2}O). Hence, by a separation of the starches of barley in the dry state and the starch may be converted into starch; and conversely, by the absorption of water, starch may be converted into cellulose.

Starch exists in three separate forms: common starch, dextrin, and cellulose. The first is interchanged between dextrin and cellulose; the second, between dextrin and common starch; and the third, between common starch and sugar.

Starch occurs in the form of globulose, 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 dissolved, 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. Payne could not detect any starch-globules in dissolving substances in the case of dextrin caras; 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, the dextrin is far more susceptible of undergoing the changes in water than in those where it is comparatively slight; 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 Payne the products of this metamorphosis are dextrin and sugar, and the cause of the action dextrin, a substance the effect of which on starch separated from plants is now well known. This is the change which freezes 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 lbs. of potatoes gave 10 lb. of starch; in September, 14-96 lb.; in October, 14-75 lb.; in November, 17 lb.; it remained constant till the end of February; in April it had diminished to 14-78 lb.

There is still considerable mystery regarding the formation of starch. We have undoubted evidence that it gives rise to the formation of dextrin and sugar, and it is just as certain that the dextrin and sugar are first converted into 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 cryptogamous 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 dahlias, heliunum, and taraxacum, but found also in many other plants. [Chemist', P. C. S., p. 345.] It is very readily converted into sugar, and it combines with this sugar and carries it with it, it is obvious that the ultimate analyses of inulin from different plants must vary. Possessing apparently the same composition as starch, it differs in not being changed into a jelly by hot water; nor does it turn blue with iodine, but 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 most likely, like dextrin, to be placed among the 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 dextrin [Chemist, P. C. S., p. 324.] is brought into contact with it. It is therefore in the form of starch and sugar, without the formation of dextrin.

As its composition is the same as that of cellulose, it is probably produced from that substance and not from starch.

So situated as to the consideration of the very important constituent of plants, dextrin, which is obtained by treating starch with diastase. [Chemist', P. C. S., p. 345.] Mulder has shown that dextrin may also be obtained from cellulose by sulphuric acid and by diastase. The quantity of diastase required is extremely minute; if much is added or the process continued too long, grape-sugar is produced. It is by those or similar means that nature converts cellulose into dextrin, and dextrin into sugar. As in making bread, starch is converted into sugar by a diastase from a mornings' meal; the same reason why it should not in a similar manner be produced in the growing plant, and convert the cellulose into dextrin.

The sap of nearly all plants contains a certain amount of dextrin, which, having the same chemical composition (C_{6}H_{10}O_{5}) as gum, and in many other points resembling it, has been in most analyses put down as gum. If one equivalent of water (H_{2}O) be taken from one equivalent of cellulose (C_{6}H_{10}O_{5}), two equivalents either of gum or dextrin (2C_{6}H_{10}O_{5}) are formed. Thus a part of the cellular membranes may be converted into dextrin by catalysis [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 dextrin does not often 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 not. Dextrin belongs to the nutrient matters; all the starch taken as food being converted by the gastric juice into it. The gums are mere excretions, and are apparently of little or no importance in plant part or algae. One of the most important is mentioned by Casseus, and by Marcellus, to which 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_{6}H_{12}O_{6}, the formation of cellulose from dextrin is produced by every two equivalents of dextrin taking up one equivalent of water. Thus

1. C_{6}H_{12}O_{6} + H_{2}O = C_{6}H_{10}O_{5} + CO_{2}.

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 one element from the elements of dextrin.

The different species of sugar, as far as they are known, are:

1. Milk-sugar: C_{6}H_{12}O_{6} + 5 H_{2}O.
2. cane-sugar: C_{6}H_{12}O_{6} + 2 H_{2}O.
3. grape-sugar: C_{6}H_{12}O_{6} + 2 H_{2}O.
4. Eucalyptus-sugar: C_{6}H_{12}O_{6} + 9 H_{2}O.

Milk-sugar is an integral compound of the milk of the mammals, 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.

Cane-sugar is the most entirely related to starch and 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 sugar-plants. Grape-sugar is identical with the honey in the honey-comb, and in diabeto, 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 and cellulose is also similar to the grape-sugar, or the free-acting sugar, 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

* The formula C_{6}H_{12}O_{6} is O in the article Chemist, P. C. S., p. 245, is evidently a mistake. 4 M 2
is the natural sap spontaneously escaping, or whether it is the sap extracted by the locust and afterwards excreted, is uncertain. Investigations have been carefully examined by Professor Johnston of Edinburgh.

There is obviously an intimate connection between these different kinds of sugar, as well as between cellulose, starch, and cane-sugar. They all contain C, H, and O, in combination with the elements of water. As they all contain C, H, or a multiple of it, they are produced from each other by a simple change depending on catalytic force. [CHEMISTRY, P. C. B., p. 541.]

If sulphuric acid is allowed to act on gelatin, a species of sugar containing nitrogen, and termed glycerol or gelatin sugar, is formed. In its formula it is C_3H_6N_2O. It is called gelatin sugar because it is formed in the stomach, and is easily digested. Hence it is subject, when changed into cane-sugar, to the same conditions as cane-sugar when supplied to the body. On these grounds Mulder considers that gelatin-sugar should be classed among the digestible substances. In fact, gelatin is not only an essential substance, but since it has been found to be necessary for the growth of the animal, then sugar, either derived directly from the food or produced from starch in the alimentary canal, may be used for this purpose.

It is not accorded to 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 seems to prove that the sap, which probably contains much starch, is changed into sugar and conveyed through the cell-walls. When sugar accumulates in certain parts of a plant, it always almost remains in solution; it is however found crystallized in small few instan cases in the formation of hoarfrost. [CHEMISTRY, P. C. B., p. 541.]

Closely allied in its chemical composition to sugar is a peculiar substance to which the term 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 perisperm of quince-seed, lime-seed, &c.; it is the chief constituent of the gums tragacanth and bassam, and is abundant in various roots, as for instance the malows. According to Mulder's analysis it must be represented by the formula C_6H_10O_5. It has been shown by Schmidt that mucilage when digested with dilute sulphuric acid is converted into sugars. There is also a link to the following series of analogous substances:

- Grape-sugar and fruit-sugar
- Cellulose and soluble mullin
- Starch, dextrine, inulin, and
- Mucole, mural sugar, and eucalyptus sugar

In its physical characters the product of the mucous membrane of the animal body resembles vegetable mucilage. Owing to its insolubility in water, both these substances serve to cover denuded parts of animals, and thus they are both suited to lessen or prevent the influence of acid matters on the tender parts of the animal frame. It is for this reason that the mucilage of sallow, tragacanth, &c., may be made, in certain circumstances, 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. [Davy's edition of Simson'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. Stearin, margin, 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 [CHEMISTRY, P. C. B., p. 544]; recent investigations have been given that this view requires a slight modification. Berzelius thinks that glycerin does not exist readily 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 (C_6H_12) which forms lipoyle. Glycerin is then formed from two equivalents of the fatty acids and three equivalents of water: 2 C_6H_12O_1 + 3 H_2O = 2 C_6H_12O_3 + 3 H_2O. (If to this we add one equivalent of water, we obtain the formula given in CHEMISTRY, P. C. B., p. 544.)

As to this view, which is supported by Redtenbacher, Varrentrapp, and Mulder, the base of every neutral fat yielding glycerin is a compound which is represented by C_6H_12O_3.

The most important of the fatty acids are:

- Stearic acid: C_17H_35O_2 + H_2O
- Margaric acid: C_17H_33O_2 + H_2O

These are universally diffused in plants and animals; and, combined with the oxide of lipoyle (C_6H_12O_3), form the neutral fats—stearin, margin, and olein; and this is the form in which they most commonly occur in the organic kingdom. Sometimes however a more powerful base (potash, soda, &c.) removes the oxide of lipoyle, and there are then formed compounds of the fatty acids with alkalies.

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 margin and olein, although in different proportions; and as margin and olein from salad-oil contain more water, they are more simple than to assume that these substances are directly transferred, without change, into the fats of the animal body.

But if some of these vegetables are eaten by a sheep, the olein and margin are converted into the fatty acids of the animal, since mutton-fat contains a large amount of stearin.

In this case the change is easily understood, for 2 eq. of stearic acid (C_17H_35O_2) = 1 eq. of stearic acid (C_17H_33O_2) + 1 eq. of oxygen. It is found that stearin when treated with stearin in two equivalents from a fatty base is produced, and one equivalent of stearic acid is produced, and one equivalent of oxygen is given off. In all probability, such a decarboxylation of the maragine in the food the sheep is really effected; and on the contrary most of the food may be in the form of fatty acids, and no simple is to assume that these substances are directly transferred, without change, into the fats of the animal body.

Fats are united to form an animal part of their case or fat. In fact the condition 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 united with the blood, we readily understand how compounds of fatty acids and soda should exist in the blood and in various parts of the body. When a soap-soda however exists in the blood, it cannot form a neutral fat, such as we have seen without combining with glycerin. This leads to the inquiry, in the first place, whether these soap-soda meet with glycerin; and secondly, if they do, whether the glycerin would combine with the soap-soda and form neutral fats. A possible reason for believing that both these questions may be answered in the negative, for the glycerin set free when the soap-soda is formed, is most probably at once decomposed; and further, that the 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 enter into this combination, the oxide of lipoyle 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 that (according to the opinion of Bertelius) glycerin is the oxide of the radical (C_6H_12). 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. While lactic acid (C_3H_6O_3) is sublimated, we obtain a white sublimable, the composition of which is C_6H_12O_5; while the composition of the oxide of lipoyle is C_6H_12O.

It may happen that there are causes of deoxidation at work in the system, by which some of the substances usually converted into lactic acid are made to produce oxide of lipoyle, which in the nascent state unites with the fatty acids, forming neutral fats.

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 margarine and oleate of soda, are again reduced to neutral fats by the influence of lactic acid.

In many parts of plants, especially in the perisperm 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 wax at all. It is the wax that gives to grapes and other fruits their characteristic sweetness; 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. Aréquin has analyzed the crystalline wax which collects in front of the mouth of the bee, and he has given the name ceresina. He mentions an important peculiarity in connexion with it, namely, that those kinds of sugar which bees have collected into wax when reversed, whereas with the reverse, whereas with the bees, which contain much ceresina but little sugar. From this we should infer, that either wax is used in the plant to produce sugar, or to form wax. This would account for the fact that in the following experiments of Gundach. 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 butter we find the following acids, chiefly in combination with oxides of lipoyle: margaric and oleic acids, and

<table>
<thead>
<tr>
<th>Acid</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butyric acid</td>
<td>C₆H₁₀O₂</td>
</tr>
<tr>
<td>Caproic acid</td>
<td>C₆H₁₂O₂</td>
</tr>
<tr>
<td>Caprylic acid</td>
<td>C₆H₁₄O₂</td>
</tr>
<tr>
<td>Capric acid</td>
<td>C₈H₁₆O₂</td>
</tr>
</tbody>
</table>

Butyric acid is occasionally present in the urine, the gastric juices, and the sweat; the others occur only in butter.

From the manner in which the plant is separated in the liver of the Phytother macrocephalus; phosphoin, in the fat of Delphina phocena; cholestearin, ambranin, in amber; and the brain-fats known as oleocaprol, cerebrof, cephalol, and steareol are illustrations of this class.

It is worthy of observation, that both in the vegetable and the animal kingdom there seems a connexion between the protein-compounds and fat: when we find solid protein-compounds, which 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 interminable discussion between the leading chemists of France and Germany. Dumas, who was acquainted with the representatives 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 at one time a quantity (about 1½ pounds) of starch in that kind of grain. Dumas however extracted 9 per cent. of 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 could be accounted for. The actual fact is, 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 are all known to possess this property; yet rice gives only 0·2 to 0·8 per cent. of matters soluble in ether (the ordinary means of determining the amount of fat); peas 1·2 to 2·6; beans 0·7 to 0·8, and dried potatoes 0·35 per cent. Thus any animal that has eaten 1000 pounds of one of these substances may obtain from them 2 to 8, 12 to 21, 7, or 8½ pounds of fat respectively. He makes the following calculations—

Three pigs to be fattened in thirteen weeks require 1000 pounds of peas, and 6925 pounds of boiled potatoes, the latter being equal to 1590 pounds of dry potatoes. These contain in all 26 pounds of starch yielding 31, and the potatoes 5 pounds. One fattened pig gives on an average 50 to 65 pounds of fat, the three yielding 150 to 165 pounds. Each pig before fattening contains on an average 18·5 pounds of fat—that is, 54 pounds for the three. If 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 90 pounds, from the starch, &c., of the food.

Leibig’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, cholostearin, cetin, pholesterol, &c. To obtain these from other fats requires just as much a new arrangement as if they were produced in the body; 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 formation of fat in plants, it is worthy of observation that all fats 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 a 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 substance these are fatty acids or highly oxidised compounds, or else that oxygen must be itself liberated. Liebig observes that if from the formula for starch, C₅H₇O₂, we take 9 equivalents of oxygen, there will remain in 100 parts—

<table>
<thead>
<tr>
<th>Element</th>
<th>Mass</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>H</td>
<td>70</td>
<td>7</td>
</tr>
<tr>
<td>O</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

The empirical formula for fat which comes nearest to this is C₅H₇O₂, which gives in 100 parts—

<table>
<thead>
<tr>
<th>Element</th>
<th>Mass</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>79-4</td>
<td>79-4</td>
</tr>
<tr>
<td>H</td>
<td>10-8</td>
<td>10-8</td>
</tr>
<tr>
<td>O</td>
<td>9-8</td>
<td>9-8</td>
</tr>
</tbody>
</table>

According to this formula an equivalent of starch, in order to be converted into fat, would lose one equivalent of carbonic acid and seven of oxygen, or (expressed in symbols) C₅H₇O₂ = C₅H₇O₂ + 4 + 7 O.

The same point is also clearly shown by contrasting the ultimate composition of starch and fat.

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>44-9</td>
<td>C₅H₇O₂</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>6-11</td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td>9-38</td>
<td></td>
</tr>
</tbody>
</table>

As we are not acquainted with any constituent of plants which can take up the oxygen thus liberated in the formation of fat, we must regard this as one of the sources of the oxygen given off by plants. Mulder has given the following scheme as an illustrative of the mode in which starch may possibly be converted into fat or oil, in the vegetable kingdom:

<table>
<thead>
<tr>
<th>Element</th>
<th>Mass</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>84</td>
<td>70</td>
</tr>
<tr>
<td>H</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>O</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

And we have

<table>
<thead>
<tr>
<th>Equivalent</th>
<th>Mass</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 equiv. of margaric acid</td>
<td>84</td>
<td>84</td>
</tr>
<tr>
<td>1 equiv. of oleic acid</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>2 equiv. of oxylipol</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>69 equiv. of oxygen</td>
<td>69</td>
<td>69</td>
</tr>
</tbody>
</table>

Making as before 84 78 78

There is a substance almost universally diffused throughout plants, which we must here notice, and that is the green colouring matter of the leaves, called plant-mass 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 power 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 while 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 actual green pigment. To prevent confusion the former is designated as 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 stems especially of such coloured; 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 gray when obtained from apples, and of a beautiful 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. chlorophylle which exists in the leaves, is sufficiently exhibited in the production from 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 in the opposite sides of B. chaise fruits, 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 secrete a considerable amount of B. chlorophylle.

This apparent anomaly 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 can only produce B. chlorophylle 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 in the plant. B. chlorophylle not excepted; thus asparagus, 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 chlorophyle or that spot does not maintain a constant colour beneath it as far as light can penetrate through the semi-transparent parts. All plants however are not coloured green; some have no colour at all, while others are speckled or spotted, or of a colour entirely different from green. Hence we conclude that in those plants or parts of plants, the materials yielding chlorophyle are absent. We may sometimes observe, in summer, one single spot of a green leaf coloured 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 wax with starch, in the yellow skins of fruits, gives a lengthened description of chlorophylle, for an account of which we must refer to the original work.

Berrillius's experiments, and those previously investigated by Bersellius, it appears that the green coloring 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 chlorophylle, but also on the different amount proportions of these colouring matters.

The quantity of pure C. chlorophylle contained in the leaves is exceedingly small; according to Bersellius, it is not more than the amount of pigment in dried cotton.

If a mixture of pure chlorophylle be exposed to the action of the sun, the green colour becomes in a few hours converted into a yellow. When a solution of pure chlorophylle in ether and hydrochloric acid was kept for five months in a bottle half full, the green was entirely changed into a yellow. From these experiments 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 in all probability a substance produced by the action of light (companied with a compound resembling chlorophylle) is green colouring matter and green leaves is constantly going on under the influence of light. Mulder conceives that the continual decomposition of the green colouring matter may be in the wax, and that the external form of the leaf 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 well known that the decomposed chlorophylle 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 known.

It is very obvious that the influence of light will convert starch into chlorophylle. Every part of an amylaceous root becomes green on exposure to light. The parts of plants which are green (except a few exceptions) contains starch; and in autumn as this green colour decreases, the starch also decreases, and finally cannot be detected by the iodine-test. Hence starch seems to form B. chlorophylle under the influence of light, and the latter substance is the same as that contained in the leaves, consisting chiefly of wax. The change of starch into botanical chlorophylle 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_6 H_{12} O. Now if no other products be simultaneously produced we may suppose the wax obtained from the starch in the following manner:

\[
\text{6 equiv. of starch} \quad C_6 H_{12} O_6
\]

With 10 of water \quad H_2 O

Make \quad C_6 H_{12} O_6

And 4 of wax \quad C_6 H_{12} O

Leaving to be given off: \quad O_2

That is to say, 6 equivalents of starch yield 4 equivalents of wax, and give off 66 equivalents of oxygen. This fully explains the phenomenon why plants become 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. chlorophylle—that from poplar leaves; for this analysis he calculated the formula C_6 H_{12} 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. chlorophylle, 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. This is just the reason why C. chlorophylle 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 this we have seen to be the case when starch is converted into wax. We may therefore assume as proved that white chlorophylle diffused throughout the whole plant, will become green in proportion as starch is converted into wax; because it is enabled, in such proportion, to take up an oxygen, which is chemically represented, as already indicated."

"Now, the probable composition of green chlorophylle, C_6 H_{12} N O, shows that pure white chlorophylle is not produced from pure starch. It is necessary for the walls in a liquid state, should penetrate into the globule of starch, which during this transformation into wax is converted into C_6 H_{12} N O._ 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 gel. Modified in an infinite variety of ways, this substance is 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 principal and the original cellulae, which, in the original in all probability varies in different cases, while the persistent exhibits a constant and general character. The persistent tissue is consequently a secondary product, and in this respect it is different from the primary one 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.

Gelatinous substance is also widely diffused over the body that it would exhibit the entire shape of the principal organs, even if all other constituents were separated. It constitutes the skin, the serous membranes, the cellular sheets of the muscles, the organ which is the most widely extended in the body; it is insoluble in cold water; acetic acid renders it soluble and prevents its petrolization; and when boiled it forms a jelly. It is in consequence of the last property that it has received the name gelatin. The gelatinous substance (skin, areolar tissue, serous membranes, &c.) is insoluble in cold water, and on boiling is physically and chemically altered. It will be seen on boiling nothing is 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

\[ \text{Ca} \cdot \text{H}_2 \cdot \text{O}_3 \cdot \text{N}_2 \cdot \text{O}_6 + 6 \text{H}_2 \text{O}. \]

This peculiarity should be remembered, for the compound is likely to be formed in the preparation of broth, and in the application of Paget's Digestor to cooking; and it is regarded by Mädler as doubtful whether this hydrated gelatin can be again converted in the organism into nutrient matter, and whether it may not produce noxious substances in the body. As gelatin has been used in a very valuable 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 alkaline in the serum, and the existing 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 alkalies, gelatin-sugar, leucin, and extractive matters are produced, while anasmin is disengaged, and an alkaline carbonate formed. Finely decomposed, it yields extractive matters with either gelatin-sugar or leucin. Since leucin is also produced from albumen when digested by pottasch, we perceive an intimate connexion between these products of digestion. Besides the gelatin obtained from cellular tissue and serous membranes there is another kind which has many of its properties in common with the gelatin, although it is described by Müller under the name of chondrin. It is obtained from the corns, and from those cartilages which do not ossify, by boiling them in water.

Its composition is 10 \( \text{Ca} \cdot \text{H}_2 \cdot \text{O}_3 \cdot \text{N}_2 \cdot \text{O}_6 + 8 \text{H}_2 \text{O}. \)

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, colouring matters, oils, and resins; in animals there are the various secretions, and in these vegetable productions 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.

As there are few products by an animal other than milk, the most of which are secretions, and these vegetable productions 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.

\* Light has recently found that albumen, fibrin, and casein contain more ash than is generally allowed, albumen containing about 8 per cent., and casein containing 4 per cent., of phosphate of lime.

\* The quantity of sulfur yielded by the formula for chondrin given in the text, and which is supposed to come from his own analyses.
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the cell-wall; Mohl opposes this view, asserting that the nucleus lies within the cell at some distance from its mem-
brane. Valentijn 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 pre-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 ele-
mental 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 organisation.

The very simplest form of fungi (such as the common mould-
plant) are produced in non-nitrogenous bodies, such as lactic or tannic acid under the influence of the atmos-
phere (and therefore of nitrogen) and of water, contain protein from the first moment of their existence.

With regard to the distribution of the various forms of cells, we must notice certain dehiscence membranous ex-
ceptions in which no definite structure can be detected. They have been especially described by Bowman and Goodair, the formers being found in blood, lymph, and chyle, and the latter in the spleen and in the serous
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.1 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 Goodyer, '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 arcellar 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

1. A portion of the germinal membrane of the human intra-glândular
lymphatics, with its germinal spots or nutritive centres diffused over it.

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 single isolated cells in the animal economy;

1. Formerly termed the primary membrane by the author.
rent the blood, as progressing in close contact with the walls of the vessels, is slower than that of the corpuscles, like the ordinary corpuscles, and seems to stick to each other. The exact functions of these corpuscles are still unknown, but there are many facts which seem to indicate that there is a decided relation between them and between the massive or organic life of the tissue.

Fig. 3.

1. Red corpuscles of human blood, exhibiting their flattened surfaces.
2. Red corpuscles of the blood of other animals, and those of man, so as to form rolls.
4. Colourless corpuscles of the blood of camel.
5. The same, enlarged by the imbibition of water.

On examining a drop of blood under a microscope, we find, in addition to those cells, which are comparatively rare, an immense number of what are termed red corpuscles, but which usually present a yellow appearance. These red corpuscles have been already noticed in the article Blood, P. C.

The following are the most important additions made to our knowledge of them since the publication of that article. The blood of many animals has been submitted to microscopic examination by Nasse, Wagner, Gulliver, and other observers.

In the article Blood it is stated that 'the red corpuscles of the blood have a circular form in all animals constituting the class mammalia.' A remarkable exception to this rule has been shown by Mandl to occur in the corpuscles of the camel tribe. The mean long diameter of the blood-corpuscles of the dromedary is to be found at the 32,548th of an inch, while the mean short diameter was only the 65,921st of the same standard. In the pac (Auchenia pacio) and guansaco (Auchenia glama) the blood-corpuscles scarcely differ in form and size from those of the dromedary, whilst in the vicuna they were slightly smaller.

The structure and magnitude of the human red corpuscles of the Camelidse such as the camelidse, are nearly as great as the smallest that have been observed in birds or reptiles.

The difference of size in the corpuscles of different mammalia is also worthy of notice. The average diameter of the human red corpuscles is 2,600th of an inch, but the average diameter of those of the elephant, according to the same observer, is as much as the 37,458th of an inch (which were the largest he observed amongst the mammalia), whilst those of the Napa musk-deer were no more than the 12,325th, and some were as small as the 16,000th of an inch in diameter. There is also a exception to the general statement that the corpuscles of the capillaries are oval; in one class, namely, the Cydtamons, or lamprey tribe, they are circular. Neither is the statement now correct that the corpuscles of the capillaries are the largest known; those of certain reptiles, as for instance the serpens and the poison, are considerably larger, and are even visible to the naked eye as minute specks.

There can be no doubt that the red corpuscles go through the same course as other cells. We have no doubt that the red corpuscles have been lost, and of the peculiar power which chalybeate medicaments 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-corpuscles, we have already stated that the globulin of which the walls are formed seems undoubtedly to be a protein-compound. The colour is due to a pigment which is received as the move of hæmoglobin. It has been generally assumed that this substance exists in two distinct states in arterial and venous blood, the pigment in the former being the excess of carbon and in the latter an excess of carbonic or carabolic acid. Mollier 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 C, H, N, O, Fe; the following being the analyses from which he deduced it:

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1, 2, and 3, were arterial, and 4 venous ox-blood; 5 was the mixed blood of a sheep.

It may be shown by conclusive experiments that the red colour is not dependent on the iron, for that constituent may be removed from the haematin without materially altering its tint, although it is very firmly combined with the four organic elements. The condition in which the iron exists in haematin—whether as an oxide, or as carbomula, or as a carburet, or in the metallic state—has long been disputed. According to Lichten the iron of the haematin is the most essential constituent of the blood in relation to the respiratory process. The following is his view of the theory of respiration:—Decomposition of the venous blood through the lungs, the globules change colour, and oxygen is absorbed from the atmosphere. Further, for every volume of oxygen absorbed, an equal volume of carbonic acid is, 'a most cases, given out. The red globules contain 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 much is certain, that the globules of venous blood are changed in colour, 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 their passage through the capillaries. All the 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 colour of the blood in the venous globules depends on the presence 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 assimilated from the air, 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 to the whole volume of arterial carbonic acid, and the serum 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 gases. 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. Sulphuretted hydrogen turns them blackish green and finally black; and the original red colour cannot 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 disappearance of carbonic acid, and the same thing takes place in nitric oxide. It is clear that they have borne undergone no decomposition, and consequently they possess the power of combining with gases, while the compound they form with carbonic acid is destroyed by it.

When left in contact with the air, the original red colour is still preserved, but it does not recover its florid colour a second time by the action of oxygen. The globules of the blood contain a compound of iron. A new solution of it takes place in red blood, we must conclude, that it is unquestionably necessary to animal life; and since physiology has proved that

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the globules take no share in the process of nutrition, it cannot be 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 substances of iron. By means of diluted muriatic acids, peroxide (seagull-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 compounds of iron in the blood are not those of the peroxide, while the compounds of peroxide of iron, under other circumstances, give us oxygen with the utmost facility. Hydrated peroxide of iron, in contact with ordinary matters distilates of sulphur, is converted into carbonate of the protoxide. Carbonate of protoxide of iron, in contact with water and oxygen, is decomposed; all the carbonic acid is given off, and by absorption of oxygen it passes into the hydrated peroxide, which may again be converted into a compound of the protoxide. 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 elements of the body; hence when decomposed, it gives off hydrogen and oxygen.

The air is rich in oxygen, and when placed in contact with these materials it is decomposed; but air is not the only source of oxygen. When it is exposed to light, cyanogen is given off, and it becomes white; in the dark it attracts oxygen, and recovers its black tint.

All these observations, taken together, lead to the opinion that the globules of the blood contain a compound of iron saturated with oxygen, which in the living blood loses its oxygen during its passage through the capillaries. This is shown when it is separated from the blood and begins to undergo decomposition. The compound, rich in iron, 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, will combine with the carbonic acid to form haematin.

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 carbonic acid 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 combine with the iron; but the absorption of oxygen causes the one volume of oxygen to combine with 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 or completely lost in the formation of carbonic acid, the amount of this latter gas expired will correspond exactly with 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 give up the carbonic acid; and, through the capillaries, become saturated with the oxygen of the atmosphere, which constitutes 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 compounds of the oxides and hydroxides of the carbonic acid, and of the other elements of haematin, that is, it cannot be removed even by long digestion. Of the same kind is the fact that aquatic animals can exist in the lungs the oxygen 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 such a compound as iron in venous blood, 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:

1. It is not probable that there is a compound of iron in the blood connected with the other elements of haematin, that it cannot be removed even by long digestion. Of the same kind is the fact that aquatic animals can exist in the lungs the oxygen has lost, and in consequence of this absorption of oxygen the carbonic acid in combination with it is separated.

2. If, as Liebig asserts, peroxide of iron exists in arterial blood, and in the state of protoxide of iron in venous blood, almost any diluted acid would be capable of removing it. But this is not the case. Haematin, properly prepared, may be digested with dilute hydrochloric or sulphuric acid for many days without the absorption of any iron. From haematin treated in this manner Mulder obtained a precipitate of carbonic acid, and obtained 9.49 per cent. of peroxide of iron, which is the constant quantity always left after the combustion of well-prepared haematin.

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 added. Mulder suggests that it occurs as an integral constituent of haematin in just the same manner that iodine occurs in sponge, sulphur in cystin, or arsenic in the caseyl series.

The importance of haematin 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 metallic 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 formed of globulin, and that globulin is the true primary globulin. When a respiration is performed, the exterior layer of such of the corpuscles as are exposed to the lungs to the action of the air, becomes converted into oxidized protein; it becomes flabby, and its red tint is bleached. These outer layers of the corpuscles exist in arterial blood. As they reach the capillary system, this white exterior 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 red 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 filled with milky glass.

The preceding observations have been made with the view of showing the utility of those isolated animal cells—the blood-corpuscles—in the respiratory 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 to notice the functions of isolated cells. We shall now give another illustration of their utility, namely, their importance in the process of nutrition. Mr. Goodair has recently shown that there is a continual development of cells at the extremity of the capillary, and that the respiratory oxygen of these cells are 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 fulfill. The process now takes in to consideration the respiration and its recensions and ramifications.

As the chyle begins to pass along the small intestine, a
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 blood of the villi is thickened, and 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 which, from the duodenal fluids, may be nearly protective epithelium; and that which lines the follicles, and is endowed with secreting functions. The same action then, which in removing the protective epithelium from the villi prepares the latter for their peculiar function of absorption, throws out the secreting epithelium from the follicles, and thus conduces towards the performance of the function of these follicles. The villi, being now turbid with blood, erected, and nuclei, are covered or coated by the whitish-grey matter already described. This matter consists of chyme, of cast-off epithelium of the villi, and of the secreting epithelium of the follicles. The function of the villi now commences. The minute vesicles which are interspersed among the terminal loops of the lacteals of the villi, 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 vesicles have thus filled with their contents, they burst or dissolve, their contents being cast into the interior of the villi, as in the case of any other species of intestinal cell. The debris, and the contents of the dissolved chyle, have disabled the villus, and 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 fasicled. 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."

Fig. 4.
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 repulsual, the one centrifugal, the other centripetal, they are both centripetal. Even in the latter state 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 merely thrown off if it be an external cell. The primary secreting cell, again, after dissipation 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. Goodall's views by the accompanying figure.

**Fig. 5.**

1. Cells from the liver of **Botta ephesus**; the cellular division is dark blue and presents a chalky appearance.  
2. Cells from the liver of **Loxos cephalus.** In this instance the bile is contained in the cavities of the secondary cells, which constitute the nucleus of the primary cell.  
3. Cells from the mammary of a bitch. In addition to their nuclei these cells contain milk-sea.  

**Persistent tissus.** We now proceed to the histological and chemical investigation of the most important constituents of the human organism.

1. **Adipose tissus** is usually associated with areolar tissus (which acc), the two being generally known collectively as cellular tissus. 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 foetus Valentin found in the subcutaneous cellular tissus 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 vesicles (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 other cases there appeared to be a deposition of fat, not occupying the whole space of the cell (c); 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 fat-cells there were observed to be two vesicles, separated by a septum, against which they were partially fastened 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, &c., 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 migrans.* They are probably always mingled with the epidermic 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 freckles, the areola round the nipple, &c. The pigment-cells are usually flat 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 foetus. 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 stellar shape in which these cells occur on the skin of that animal. The nucleus...
as sufficiently obvious in one of the cells in a, in c, d, e, and g.

4. It 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 \ldots \ldots \ldots 58.264
Hydrogen \ldots \ldots \ldots 64.16
Nitrogen \ldots \ldots \ldots 13.768
Oxygen \ldots \ldots \ldots 29.090

From these analyses it appears probable that the black pigment contains a large amount of carbon than any other constituent of the animal body.

3. Horns, feathers, hair, scales, the various forms of epithelium and the crystalline lens. 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 epidermis 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 studied carefully by Bowman (Art. ‘Membranes,’ in Todd’s ‘Cyclopedia of Anatomy and Physiology,’ 1842), Goodf. and others. From the forms presented by the epithelial particles they have received different names. Henle divided them into simple epithelium or tesselated epithelium, cylinder epithelium, and eli-epithelium, and although they frequently run in one another, yet on the whole these distinctive terms are serviceable.

**Fig. 10.**

The three forms of epithelium. 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 effective 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 epidermic scales of the frog; the larger cells, b, lying above 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, or on the conjunctival surface of the cornes of the eye. We have attempted to depict the latter in Fig. 10, B.

The eli-epithelium is little more than cylinder epithelium on whose free surface numerous cilia or delicate filaments 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 not quite 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 air-passage with their various offsets, as the nasal orifices, mustache 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 shape of the hair is that portion which is fully formed and projects beyond the surface. On examination we find it lodged in a follicle involution of the basement membrane (Fig. 11, a), which usually passes through the cells into the subcutaneous circular tissue. This hair-follicle is bulbous at its deepest part, like the hair which it contains. Its sides have a cuticular lining, b, continuous with the epidermis, and resembling the cuticle in the rounded form of its deep cells and the scaly character of the more superficial ones, which are here in contact with the outside of the hair, c. The hair grows from the bottom of the follicle, and the cells of the deepest stratum, there 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 mount in the soft bulb of the hair, which indeed owes 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 nuclei 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 those which contain pigment and those which do not.

The granules of pigment assumes a linear arrangement between the fibres, which are firmly united into a solid rod by a masticular 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 those 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 overlapping of the delicate cells is still exhibited by elegant and exceedingly fine sinus.
The fibrous interior and this peculiar cortex together compose the shaft of the hair. By the close and emergent arrangement 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 it in 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 those, and that beyond this series comes the cuticular lining of the follicle, so that the hair is neither covered nor underlay by cuticle, but it is in fact the modified outside of the bottom of the follicle.

**Fig. 12.**

3. Transverse section of a hair of the head, showing the exterior cortex, the finnose with scattered pigment, and a central space filled with pigment. 4, a similar section of a hair at a point where no aggregation of pigment in the softest, 5, longitudinal section, without a central cavity, showing the imbrication of the cortex, and the arrangement of the pigment in the fibrous part. 4, surface showing the obvious transverse lines formed by the edge of the cortical annulus. 5, a portion of the margin, showing their imbrication.

The figures 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 Woehler's *Annalen*, vol. xi, p. 53):

<table>
<thead>
<tr>
<th>Component</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>0.765</td>
</tr>
<tr>
<td>Oxygen</td>
<td>0.765</td>
</tr>
<tr>
<td>Carbon</td>
<td>0.999</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>0.999</td>
</tr>
<tr>
<td>Sulphur</td>
<td>0.999</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-derived experiments he concludes that "the hair consists essentially of -"

1. A connecting medium consisting of a tissue yielding gelatin, and represented by the formulas C6H10N2O2.

2. Of bismuth of protein, C6H10N2O2.

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 peroxide of iron, which is supposed by Van Laer to be chemically combined with the protein.

**Fig. 13.**

Yellow fibrous tissue showing the entire and branched disposition of its fibres. Arolear tissue is dispersed over almost every portion of the body, being the substance most commonly (but incorrectly) termed cellular tissue. The following are the microscopic characters of this tissue, as described by Bowman and Todd:

When a fragment is examined, it presents an inextricable interlacement of tortuous and wavy threads, intersecting one another in every possible direction. They are of two kinds. The first are chiefly in the form of bands of very unequal thickness, and inelastic. Numerous streaks are visible in them not usually parallel with the border, though taking a general longitudinal direction. These streaks, like the bands themselves, have a wavy appearance, but can be rendered straight by being stretched. The streaks seen have more the marks of longitudinal creasing than a true separation into threads; for it is impossible to tear up the band into filaments of determinate size, although it manifests a decided tendency to tear lengthways. The larger of these bands are often as wide as the 5000th of an inch; the smaller can only be detected with high powers. These are the white fibrous element. The others are long, single, elastic, branched filaments, with a dark, decided border, and disposed to curl when put not on the stretch. They interfere with the others, but appear to have no continuity of substance with them. They are most commonly about the 8000th of an inch in diameter. These form the yellow fibrous element.

**Fig. 14.**

The two elements of Arolear Tissue in their natural relations to one another. a, the white fibrous element, with cell-nuclei, b, sparingly visible in it; c, the yellow fibrous element, showing the branching or anastomosing characters of its fibres; d, fibres of the yellow element, far finer than the rest, but having a similar circular diameter; e, nucleus cell-nuclei, often seen apparently lower.
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, while it produces no change in the latter. It thus brings into view corporcles of an oval shape, which are probably the nuclei of the cells from which the bands have been originally produced. Oval corporcles (Fig. 14, a), 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 acral tissue from beneath the skin of a five-months fœtus, 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; while 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 neural, and the fibrous. The vascular nervous matter is grey or cinnibrous in colour and granular in its texture, containing nucleated nerve-rosettes, 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; while 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 fibres have been observed by microscopists in the fibrous matter; they have been named the tubular fibre, or the nerve-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 sarcodermum 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 acutaneous 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 Ehrenberg 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 possible to recognize any more definite structure. Hence the tubular fibre consists of these 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 fibres, causing it to assume a varicose appearance. Two conditions seem to favor 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 extremities 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 supposed that these varicosities were natural and existed during life, and that they furnished a valuable morphological character of the nerves of the spinal senses and the cerebro-spiral 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 128th to the 6500th of an inch, in birds, from the 3000th to the 3000th of an inch; in reptiles—in the frog—from the 1290th to the 2800th of an inch; in fish—in the eel—they are the 104rd of an inch, and in the optic nerve of the cool-fish they are the 850th of an inch. These primitive tubes present no subdivision or branching. Whatever be the connexion which such primitive tube 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 Ehrenberg 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 unstripped 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 characterizes 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 6000th 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 other.

We now proceed to the consideration of the vascular nervous matter, which in its normal form may be regarded as gkelig (Fig. 18, A, a, and B, a). This form is however liable to great variation, and from the comparison to which these nerve or ganglion-globules, as they are termed, are exposed, they may become oval or polygonal, or they may extend
The wall of each vesicle consists of an exceedingly delicate membrane, 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.

**Fig. 18.**

A, vascular and fibrous matter of the lamina of the cerebellum; b, ganglion-globule; c, very minute nerve-tube traversing a finely granular matrix, in which are numerous rounded nuclei.

Fig. 19.

A, nerve from the finger, natural size, showing the Pacinian corpuscles; b, unusual form from the mesentery of the cat, showing two included in a common envelope; c, are the two nerve-tubes belonging to them; d, another from the same, showing an effect from the central cavity, containing a branch of the nerve; e, rare form from the mesentery of the cat, showing two corpuscles placed in succession on a single stalk, and furnished with the same nerve-tube, which traverses the white substances in the interval between them. From Todd and Bowman.

**Fig. 20.**

Pacinian corpuscles from the mesentery of a cat, intended to show the general construction of these bodies. The stalk and body, the outer and inner system of capsules, with the central cavity, are seen. a, Arterial twigs, ending in capillaries, which form loops in some of the interstitial spaces; and one penetrates to the central capsule. b, The inner or innermost of the stalks, prolonged from the neurolemma. c, Nerve tube advancing to the central capsule, there losing its white substance, and stretching along the axis to the opposite end, where it is fixed by a tubular 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 corpuscles no satisfactory account has yet been given. Pacini is himself inclined to believe that they may be concerned in the phenomena of what is called animal magnetism.

6. **Muscular tissue.** There are two forms of muscular fibre, differing extremely in their microscopic characters. The fibres of the voluntary muscles, as well as the fibres of the heart and 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. [Mivart. 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 interfere, forming membranous organs, enclosing a cavity which their contraction serves to constrict.

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, whilst in the stapedius (in the middle ear) they are not two lines. They vary in diameter from the 60th to the 1600th of an inch, being largest in crustacean 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 along that these fibrillae are often detached, though 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 discs, and not fibrillae, are obtained; and the cleavage is just as natural as the former, though less frequent.

Fig. 21.

A

B

Transverse section of three elementary fibres of the dorsal pectoral muscle of a seal, treated with weak nitric acid.

Fig. 22.

2. That fibrillae 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.

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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 Sarcodeomys or tubular sheath enveloping 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 corpuses, the remains of cells, 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 Valentin and Schwann have thrown much light on the development of muscles in the embryo. In its earliest stage, muscle consists of a mass of unstriated 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 fibre.

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 bird's eye, three inches long.

c, d, e. Transverse stripes apparent. In c the nuclei are internal and lodge the disc; in d, if they are placed on the surface. From a fetal cell, two months old.

d. Transverse stripes fully formed and dark; nuclei disappearing from view. From the human fetus at birth.

f. Elementary fibre from the adult, treated with acid, showing the nuclei a from Schwann. The rest from Bowman.

As the cells unite, a deposit 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 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 unstript or non-stripled fibres consist of flattened bands, generally of a pale colour, bulged at intervals by oval or elongated corpuses. 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 arterial tissue, vessels, and nerves, it is impossible to speak with certainty regarding its behaviour towards reagents. Playfair and Bouchekann have analyzed the dried muscular flesh of the ox, and found it to be identically in its composition with dried blood. For an account 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 chorda dorsalis of the cartilaginous fishes. In other kinds of cartilage the cells are embedded in an intercellular substance, presenting certain varieties of appearance.
In articular cartilage the cells are oval or roundish, dispersed in groups through a nearly homogeneous intercellular substance. The cells measure from the 1,800th to the 900th of an inch. In the interior part of the intercostal cartilages the cells usually assume a more or less linear arrangement. In the different cartilages the cells vary in size and form. For the chemistry of cartilage, see Simon, vol. ii. p. 415.

8. Osseous Tissue has, during the last few years, been examined closely, with much success. These examinations have increased our knowledge of the nature of bone, as regards both its minute structure and its development. We must here confine ourselves to the former point.

The canals which are everywhere found traversing variously the substance of 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 Clopton Havers having been the first who gave a full account of them. The parieties of these canals have a laminated arrangement. The laminae themselves are numerous and placed concentrically; the internal laminæ, 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 lamina, there are others which surround the exterior of the bone, and may be known as the superficial lamina. In connexion 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 tubules 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 calcified cells, have a definite relation to the Haversian canals and to each other.

The Haversian Canals, the osseous lamina, 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

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**TIS**

**Fig. 25.**

Fibres of unstriped muscle, —, in their natural state; a, treated with acetic anhydride. A, section close to the surface; B, section far in the interior.

**Articular cartilage from the head of the humerus. Vertical sections:** A, section close to the surface; B, section far in the interior.

**TIS**

**Fig. 26.**

**Transverse section of the dense portion of the femur.**

a, Haversian canals; b, Concentric lamina; c, Lamina of connection; d, Corpuscles or nuclei detached, showing their various appearances.

**Fig. 27.**

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.
They vary very much in number, but the most common amount is ten or twelve. Of these, the internal laminae, which forms the parieties 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. 9. 4). In this substance we find the laminated arrangement least 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 systems. 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 laminae of the Haversian system whenever the latter arise at the surface of the bone; the external laminae, 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 bone. 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, 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 fetus 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 300th to the 500th of an inch. The Haversian canals undeniably passage to blood-vessels, this being their principal if not only purpose.

The corpuscles or cells of bone cannot be described as having any definite unvarying shape or size. The general form is a compressed oval, though not unfrequently 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 mammals, birds, reptiles, and fishes, it has been shown by Mr. Quellett 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 osteology is obvious. Connected with the canals are numerous 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, since these cells shall be found possessed of a like number of branching tubes. The general arrangement of the tubes is radiate, as regards the cells which form their common centre. The connexions are so numerous between the tubes and between the cells through 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 exist, the cells in the Haversian system, the cells 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 Bibra. From the latter we have gathered forty years, who committed suicide, Lehmann obtained—

Humes. Femur.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphate of lime and fluoride of calcium</td>
<td>50-56</td>
</tr>
<tr>
<td>Carbonate of lime</td>
<td>3-28</td>
</tr>
<tr>
<td>Phosphate of magnesia</td>
<td>1-10</td>
</tr>
<tr>
<td>Chloride of sodium</td>
<td>0-37</td>
</tr>
<tr>
<td>Soda</td>
<td>0-85</td>
</tr>
<tr>
<td>Organic matter</td>
<td>31.52</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

For a full account of the chemistry of bone we must refer to Simon’s ‘Chemistry,’ vol. ii. pp. 356-414, or Von Bibra, ‘Chemische Untersuchungen der Knöchen,’ &c, Schweinfurt, 1844.

9. Tooth.—The structures entering into the composition of the tooth are three: dentine, or tooth-substance; enamel; and cement, or more properly bone-tissue. 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, do not 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 superincised the enamel and the tooth-bone, the former investing the crown, the latter the layer of 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 enamel and cement are 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, dental tubes; secondly, intertubular tissue. The tubes have distinct parities, 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. If a vertical section, passing through the pulp-cavity, be taken 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 latter, or they may be seen 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 out in their way numerous small branches, which, meeting with other similar branches, either unite with them, or meeting with simple cells in the intertubular tissue, there terminate. Towards the surface of the dentine it is uncommon to see a tube alter its course, and by joining another, form a loop. The tubes all commence in the pulp.
in character of formation, could 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 regions, the hemispheroid or oval cells are found, especially near the surface of the dentine of the flank, as a great mass of thickenings, resting on a large number of thin, flat and closely united cells. Their thin plate is an approximation to a six-sided prism, and their sides are relatively uniform, being about the six times in diameter or diameter, at the least, to the distance taken by the observer for the most part vertical to the surface of the dentine uniform, which they rest; those therefore which proceed from the base of the crown and rise vertically, while those from the external surface of the teeth 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, and meet at their external ends. This juncture is imparted imperfect, and leaves a fissure, under which the dentine, being less protected from external influence than on 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, whence in course of time they frequently describe curves. The distribution of the fibres in the intertubular fibres is sometimes perfectly parallel; indeed, they often diverge or cross each other at considerable angles. The curves also seem less regular than those formed by the dentinal tubes.

The degree of the neck, or that by which the surface of the teeth communicate with the bone. When the dentine is received into a layer of bone, it is slightly altered, as the area of the bone is divided into two or three branches of varying proportions, and by entering the external foramina, the branches of the bone receive a much deeper impression on the surface of the bone. The depth of the dentine, then, which enters the bone, is not much different from the bone-cells, and in a similar manner, and with a much deeper impression. The depth of the dentine, then, which enters the bone, is not much different from the bone-cells, and in a similar manner, and with a much deeper impression. The depth of the dentine, then, which enters the bone, is not much different from the bone-cells, and in a similar manner, and with a much deeper impression. The depth of the dentine, then, which enters the bone, is not much different from the bone-cells, and in a similar manner, and with a much deeper impression.

For the importance of the microscopic investigation of the teeth in the classification of existing and the determination of extinct species of vertebrates, we must refer to Prof. Owen's 'Class of Vertebrata.' One of the most splendid works ever published.

Chemistry of the dentine. - Von Bibra has instituted numerous analyses of the teeth of man and the lower animals. We select the following by way of illustration:

- Molar tooth of a woman of an aged 25 years.
- Molar tooth of an adult male.
- Enamel, portion of dentin.
- Dentine, portion of dentin.
- Phosphate of lime, with a little flocculent alkali. 8â‚¬â€†6â€†5â€†7â€†4â€†9â€†6â€†2â€†6â€†0â€†7.
- Carbonate of lime. 8â€†8â€†7â€†7.
- Phosphate of magnesia. 2â€†5â€†2â€†9.
- Soluble salts. 0â€†9â€†1.
- Cartridge. 2â€†9.
- Fat. 0â€†5.
- 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 this, and perfectly distinct from these are numerous more or less results of disease. In this class we must place granular cells, the various forms of morbid tumours, cancer, ulcerative, scrofulous, etc., and part of the cataracts and ulcerative of the disease. 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. De la Rue.

Section III. - Nutrition and the Secretions.

We shall here notice those points in the chemistry of the blood - the general nutrient fluid - which have been the subject of investigation by our best investigators. The whole subject of nutrition, in connexion with the blood, has been treated by Dr. Poole, P. C., and adopted a similar course in relation to the various sections already就够了 by it.

We shall, in the first place, however, offer a few remarks on nutrition, with the view of bringing up the article Food, P. C., up to the present state of our knowledge. The classification of foods in that article is not at present adopted by chemists and physiologists.
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 conversion into blood, and are therefore incapable of forming organised tissues. They are, however, not without their use; their function, according to Liebig, to support the process of respiration. The blood-corpuscles are formed in the bone-marrow; the expenditure of oxygen is attended with the development of heat. These latter foods bear the terms the elements of respiration.

Nitrogenous Foods, or Protase, is a Substance of Eminent Right.

Vegetable fibrin. Fat, Pectino.

Vegetable albumen. Starch, Borsone.

Vegetable casin. Gum.

Animal flesh. Cane-Sugar, Beer.

Animal blood. 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 Foons that 'gelatin is a highly nutritious principle requires some notice. Liebig has established it as a law that "no nitrogenous compound, the composition of which differs from that of fibrin, albumen, or casin, is capable of supporting the vital processes in animals." The animal organism," he observes, "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 formed to it newly formed in its body but its form— that is, in its chemical composition. If the body is alone, 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. 620), 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. When in the body of a starving or sick person the fat disappears, and the muscular tissue 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 gelatious tissues. 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 as similar as possible to that in which it was formed. From these facts Liebig infers 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 tissues as have been converted to bones. And when the powers of nutrition in the whole body are affected by a change of the kind, 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 deciding influence on the state of the health. Given in a form adapted for assimilation, they serve to husband the vital force, just as may be done in the case of the stomach, by means of the food in general. Brittleness in the bones of the graminivorous 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 in which gelatin acts not, no one who has seen much medical practice will exist as a soda compound. Some of the cases, of the stomach, in which we have missed the conditions 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 exist as a soda compound. 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. 102, London, 1845; published by the Sydenham Society); also on the effects of various medicines and re-agents on the corpuscles (Ann. Ch., vol. 115, pp. 107-112). Additional information on the acceleration or retardation of the coagulation may be found in Hamburger's Thesis on that subject, published at Berlin 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.
5. Carbonate of lime, magnesia, and soda. Calcium carbonate.
8. Urea—a trace.
9. Sugar—a trace (?).

It will be observed that there are notes of interrogation to several of the salts: the presence of these constituents is denied by Enderlin and Liebig's school generally. Their objection is founded on the circumstance, that if these salts were exposed to a red heat, they would become converted into carbonates; and that the ash obtained from the incineration of the animal body, we shall give the leading grounds on which the presence of carbonate of sodium is disproved, and its alkalinity is otherwise accounted for:—

The ash does not effervesce on the addition of an acid.
2. Hot water poured over the ash becomes alkaline; it holds in solution alkaline phosphates and sulphates, chloride of sodium, and sometimes chloride of potassium, but no other salts.
3. On the addition of a neutral solution of nitrate of silver to this fluid, there is a yellow precipitate which is partly soluble in nitric acid; a portion however consisting of chloride of silver remains unsolved. The addition of nitric acid causes no effervescence. On neutralizing the acid filtrate with ammonia, a yellow precipitate of trisubphosphate of silver (3 A O, P 2 S 2 O 7) is thrown down.
4. On treating the aqueous solution of the ash with a solution of chloride of calcium, there is a copious gelatinous precipitate of phosphate of lime (3 A O, P 2 S 2 O 7) which dissolves in nitric acid without effervescence. On treating this acid solution with nitrate of silver, and neutralizing with ammonia, the trisubphosphate of silver is precipitated as before. The addition of the chloride of calcium neutralizes the previously alkaline fluid. From 1, we see that the alkaline reaction is not due to the presence of alkaline carbonates; and 2 shows it is not dependent on the presence of free potash or soda, for otherwise the fluid would not be neutralized by the chloride of calcium. Hence the ash in the blood cannot exist as a soda compound. The solution therefore is of carbonate of sodium, but there be alkaline lactates, acetates, nor fatty-acid salts in that fluid; and on the above grounds Enderlin conceives that we are justified in assuming that the alkaline reaction of the
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Arterial to it” 2-346 56x171 always qolouring rally two blood. the
making's soda water, analyses 1846.) generally of Bereelius, N generally
of the, views of Ludwig. The
D. Fibrin Fat
choleic, and Demarcay made
of the stomach. The foci of disease
by opium. L'Heretier has recorded the mean of 10 analyses of the
saliva of healthy persons — made while fasting.

TIS

Therefore regarding the salts actually occurring in the blood is however far from settled, Ludwig having during the last few months positively denied Eberlin's statements: (See Day's "Report on the Progress of Chemistry," in Rankine's Half-yearly Abstract of the Medical Sciences, vol. iii., 1846.)

Generally speaking it is only requisite in the analysis of the blood, to determine a few of the most important constituents; as, for instance, the water, fibrin, blood-corpuscles (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 Figuer. It is based on the fact, well known many years ago by Berzelius, that after the addition of a solution of a neutral salt to destributed blood, the globules do not (as before) pass through the filter paper. On the addition of two parts of solution of sulphate of soda of specific gravity 1130 of one blood, Figuer found that the whole of the corpuscles remained on the surface of the filter. The following are the steps in this process. The fibrin is removed by stirring, drain 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 known by evaporating a small known 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. Separate and frequently difficult processes are required to detect those ingredients which occur in small quantity or only in morbid conditions.

Distinctions between Arterial and Venous Blood.—We have already (p. 102) mentioned the circumstance that the external envelope of the blood-corpuscles 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 influences of the white investing membrane. But there is yet another mode in which it acts. The buoyant mass 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 buoyant mass consists of the outer part of the oxides of protein — of the very same matter with which the blood-corpuscles become invested. For this reason the form assumed by the two layers on both sides of the little flat body — the corpuscle — is determined by the buoyancy of the blood. Resulting from this tendency to contract and become bi-concave is so strong, that the central portion of the clot becomes entirely depressed. In this form the corpuscles reflect a great deal more light than when, in consequence of the recovery of the buoyant mass in the capillaries, they have a less bi-concave form.

From four analyses of the blood of horses, Simon deduces the following rule regarding the chemical differences of arterial and venous blood. 'Arterial blood 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-corpuscles of arterial blood contain less coloring 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 more 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 securing correct chemical conclusions. The following table represents the mean composition of human venous blood without reference to sex. —

| Component | Water 762-725 | Cholesterol 205-169 | Fibrin 2-104 | Fat 2-346 | Albumen 76-650 | Hematin 103-920 | Extractive matters and salts 12 012 |

100 parts of blood-corpuscles contained 6-7 of hematin. Hence the blood contains about 20 per cent. of solid constituents, and 0-2 per cent. of fibrin, and about an equal quantity of fat; the blood-corpuscles considerably exceed the albumen in quantity, and contain about 5 or 6 per cent. of colouring matter.


Lymph and Chyle.—Closely allied to the blood are the

lymph and chyle. 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'Heretier, Rees, and Nasse; and of the latter by Simon, Rees, and Nasse.

From a consideration of the blood we naturally turn to that of the various secretions yielded by it.

The saliva has been analysed by Simon, L'Heretier, and Wright. The following is Dr. Wright's account of healthy saliva: 'It is a yellow fluid resembling aqueous prussic acid, and in a healthy subject is always secreted after a meal than 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 in either alkaline or neutral, or even acid, state. The belief in the existence of the principle termed ptyalin, although it separates from the saliva by a new process, which is to pass saliva through ordinary filtering paper, and after filtration have been accomplished, the 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 sulfo-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 alcohologues, &c. It is also increased by the internal use of prussic 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 periodate of yellow dye a brilliant yellow-red coloration, of which the analysis of iron must not be overlooked in examining the stomach in a case of suspected poisoning by opium. L'Heretier has recorded the mean of 10 analyses of the saliva of healthy persons — made while fasting.

Water 980-5 Organic matter 12-6 Inorganic matter 0-9

The ptyalin formed 2-5 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 diastase. 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 washed with a little alcohol, the 100 parts of the dry residue were dissolved in 100 of water, to which 10 of hydro—
cholic 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 became turbid. On removing the oil and allowing the fluid to rest for several days, a precipitate of a green deposit. This dark green bitter precipitate is Demarçay’s cholic acid, and is regarded by him as consisting of nine-tenths of the solid constituents of the bile. It is still mixed with muriatic acid, chol(e)tin, pigment, &c. After their removal it forms a yellow spongy mass, which rapidly absorbs oxygen from the atmosphere, is very bitter, slightly soluble in ether, soluble in water, and very soluble in alcohol. The characteristic property of it is the addition of a solution of soda to an alcoholic solution of cholic acid, and then passing a current of carbonic acid through it to remove the excess of soda, possesses all the characters of ox bile: it yields on evaporation a brown resinous mass, and is soluble in water and in alcohol.

When cholic acid is boiled with hydrochloric acid it yields ammonia, taurine (see Taurin, P. C), chol(e)tid acid; the latter being insoluble is decomposed. The formulae usually assigned to cholic acid, taurine, and chol(e)tid acid are, \( \text{C}_5\text{H}_9\text{N}_2\text{O}_3\text{S}_2 \); since it contains no less than 26-6 per cent. of sulphur which had been previously altogether overlooked (Liebig and Willich, in Annalen der Physik, vol. 12, p. 245, 1846). Hence there can be no doubt that the formula for cholic acid also requires considerable modification. For further information on the recent history of the chemistry of the bile we must refer to Duesberg's 'Reports on the Progress of Animal Chemistry,' in Rankin's 'Half yearly Abstract of the Medical Sciences,' vol. ii. and iii.; and Plater's 'Über die Natur und den Nuten der Galle,' Heidelberg, 1845. The following description of the microscopical and chemical character of healthy human bile is condensed from a series of papers on the subject by Frerichs (Hannovers. Med. Ann., 1. and iii., 1845).

In colour it is always a deep brown, but when seen in thin layers it has a brownish-yellow tint. It is very fluid, being viscous only in newborn infants. The specific gravity varies from 1028 to 1040. 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 cells, either cast out of the flakes, or irregular dark granules, which disappear on the addition of a solution of potash, apparently pigment cells. 4. Occasionally minute crystals of chol(e)tin, occurring as colourless rhombic talc-like crystals.

The chemical characters are shown in the two following analyses. The bile in these cases was obtained from healthy men, killed by severe accidents:—

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>96.00</td>
<td>85.92</td>
</tr>
<tr>
<td>Solid constituents</td>
<td>14.00</td>
<td>14.08</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0.16</td>
<td>0.38</td>
</tr>
<tr>
<td>Magnesia and lin</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Mucus</td>
<td>2.65</td>
<td>2.89</td>
</tr>
<tr>
<td>Chol(e)tic acid</td>
<td>0.02</td>
<td>0.20</td>
</tr>
<tr>
<td>Thranite (phosphor of soda)</td>
<td>0.50</td>
<td>0.93</td>
</tr>
<tr>
<td>Basic phosphite of soda</td>
<td>0.18</td>
<td>0.28</td>
</tr>
<tr>
<td>Sulphate of lime</td>
<td>0.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Peroxide of iron</td>
<td>0.02</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Plater has recently succeeded in obtaining cholic acid and chol(e)tic acid of soda in a crystalline form. This is a mere excrementitious fluid, intended to remove effects of the bile, but that it is secretion essential to the animal economy, was rendered almost certain by the experiments of Berzier, Teyler, and Schlösser, which showed that the human faces contained much too small a quantity of a substance producible by the body, as that it is evacuated in this manner. 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 the ash from the contents of the duodenum alone effervesced on the addition of an acid, thus showing that the choleaste of soda (which yields the carboatomic incineration) is absorbed before reaching the jejunum. Schwann has made experiments to the same opinion beyond a doubt, by a series of well-derivated experiments on dogs. He tied the ductus choledochus, and at the same time formaldehyde, in the gall-bladder, by which the bile escaped externally. His observations are as follows:—first, 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 in weight; and, secondly, that besides the channel for the conveying of bile, there is re-established symptoms of deficient nutrition, wasting, debility, &c. Hence, and death is the ultimate consequence.

The chemistry of this subject is still very unsettled; it has been recently made the object of especial study by Bloudot, Bernard and Berrewil, Molens, and Dr. R. D. Thompson, who have obtained very contradictory results.

The mud has been recently examined by Simon, Cream, and Dunna. The reader will find a copious account of the chemistry of this secretion in Simon's 'Animal Chemistry,' vol. iii. pp. 49-69.

The urine has, since the publication of the article Uzmann, P. C., been made an object of especial investigation by Liebig. The most important fact that has been discovered is that hippuric acid is, although in small quantity, a constant ingredient of this secretion. The importance of this fact is its tendency to suggest that the urine and hippuric acids possess of combining with the potash or soda of the alkaline phosphates, and thus forming hippurate.

The brief space necessarily allotted to this article has rendered it imperative on us to omit the consideration of many points of very high physiological importance. For further information on the subjects contained in the preceding pages we must refer to the following works:

On the Structure of Animal Tissues—Hene’s Algemeine Anatomie; the article 'Tissues (Gewebe) in Wagner’s Handwörterbuch der Physiologie, Böman and Tedde’s Physiological Anatomy and Physiology; the works of Dr. Carpenter; Gooden’s Anatomical and Physiological Observations; the articles 'Muscles, 'Muscle,' and 'Osseous Tissue;' in Todd’s Cyclopaedia of Anatomy and Physiology; and Mr. Tomes’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 Hensley’s Structural and Physiological Botany.

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 Rankin’s 'Half yearly Abstract of the Medical Sciences;' to Liebig’s 'Animal Chemistry,' translated by Gregory; to Muller’s 'Versuch einer Allgemeinen Physiologischen Chemie;' to Lehmann’s 'Lehrbuch der Physiologischen Chemie;' and to L’Heritier’s ‘Traité de Chimie Pathologique.’

TLEMSN. [ALGERS, P. C., p. 330.]

TOD, JAMES, Lieutenant-Colonel in the service of the East India Company, was born in 1789, in England, but educated in Scotland. He went out to India in 1806, and obtained a commission in the 2nd Bengal European regiment; thence he volunteered for the Mowzcaus, was transferred to the marines, served as a marine on board the Mornings, and, in 1808, when in the subordinate service at Gwalior, in Hindostan, was attached, under his friend Mr. Graeme Mercer, to the embassy sent at the close of the Marattas war to the camp of Sindia in Mowar, where he remained from the springing of 1806. Rajpoottana, of which Mowar is one of the states, thenceforward became the scene of his official labours, as well as of the geographical, historical, and antiquarian investigations by which he distinguished himself. He went back to England in 1817, 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, the previous maps of the country having been very imperfect and erroneous.

The maps so far as they intersected the entire control of five of the states which had just then placed themselves under British protection, Mowar, Marwar, Jassimulre, Kotah, and Boondee. The results of
his investigations into the geography, history, and antiquities of Rajputana are given in his 'Annals of Rajasthan.'

In 1852, the impaired state of his health rendered it 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 Rajputana 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 literary pursuits. He often acted as a librarian to 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. When he arrived his house 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 Gujterat. The last chapters of the work were written in October, 1835, 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, 1835, 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, 1835, at the age of fifty-three. He left a widow, the former Miss Flutterby, and a family.

Bishop Heber, who travelled through Mewar and the adjoining Rajput states, in 1825, on his way to Gujerat, bears testimony to the affection and respect borne to Colonel Tod by the country people. He says, 'After a sort of travelling through which the bishop passed, he says, 'Here and in our subsequent stages we were continually asked by the cutwals, &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 its people rich or poor, except thieves and Pindars, loved him. He, in fact, Mr. Smith told me, loved the people of this country, and understood their language and manners in a very unusual degree.' Bheelwar, a commercial town, which had contained 12,000 families, had been nearly ruined by the depredations of the Maharratts 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 Bheelwar, the work of my hands, in February, 1818, there was not a dog in it; in 1822 I left 9000 houses, of which 1200 were bankers and merchants.

An entire street, paved, was built under my directions, and with my means. The merchants from Calcutta, Jessulmer, Delhi, Surat, from every mart in India, had their correspondents, and in fact it was becoming the chief mart of Rajasthan. The people a thousand times repaired the damages they had received, and the roads were repaired for the first time. The people had been kept in the state of preparatory poverty.

Bishop Heber, after describing the prosperous state in which he found the town in 1825, says, 'The place had been entirely ruined by Jumahoo Khan, and desolated by all his predecessors.' Captain Tod then introduced the Bheels to some of our established 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 ought to be called Todgir, but there is no need, for we shall never forget him.'

The 'Annals of Rajasthan' were published in London, in 2 vols., 12mo., 1826, and 1827. Bishop Heber's Narrative of a Journey through the Upper Provinces of India, 1824, 1825, and 1826, is an excellent work. It周淑教 was educated at Hertford College, Oxford, where he proceeded M.A. in 1786.

He became a minor canon of Canterbury Cathedral soon after his graduation. In 1792 he was appointed by the Dean and Chapter of Canterbury to the vicarage of Milton, near that city; and some years after, by the same body, to the rectory of Allhallows, Lombard Street, London, on which he fixed his residence in the metropolis. In November, 1803, he was appointed, by the Archbishop, Keeper of the Manuscripts at Lambeth. In 1820 he was withdrawn from London, by being presented by the Earl of Bridgewater to the rectory of Settrington, in Yorkshire, of the value of 1046; in 1825, was appointed to the see of Hildesheim; and, finally, in 1832 he was appointed Archbishop of Cleveland.

His first work published was Some Account of the Deans of Canterbury, from the new foundation of the Church by Henry VIII., 8vo., 1788. This was followed by an edition of Milton's 'Masque of Comus,' with notes and illustrations, from a manuscript belonging to the Dean of Bridges, 1798; 'The Poetical Works of John Milton,' with notes and life, 6 vols., 8vo., 1801, for which he received 2000l. from the booksellers, and of which there was a second edition in 1817; 'The Works of Edmund Spenser,' with notes and a Life, 8 vols. 8vo., 1806, reprinted in 1845; 'Illustrations of the Lives and Writings of John Gower and Geoffrey Chaucer,' 8vo., 1810; 'A Catalogue of the Archi-eapiscopal Manuscripts in the Library at Lambeth Palace,' vol. 1829 (100 copies privately printed); a new edition of Dr. Johnson's Dictionary of the English Language, with corrections and additions, 4 vols. 4to., 1814, &c., and again in 3 vols. 4to., 1827; 'The History of the Collected Works of Daniel Defoe' 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.; and in 1839, 'A Supplement to the 'Psalms and Translators of the Bible' (in reference to Bellamy's new translation), 8vo., 1819; 'Observations on the Metrical Version of the Psalms, by Sternhold, Hopkins, and others,' 1826; 'Memoir of the Life and Writings of the Right Rev. Brian Walton, Bishop of Chester,' 2 vols. 8vo., 1821; 'An Account of Greek Manuscripts of the late Professor Carlyle, now at Lambeth,' 8vo., 1829 (privately printed); a new edition of the 'Doctrine of the Sacrament,' 8vo., 1825, with a Vindication of Cranmer, reprinted in 12mo. in 1826; 'A Letter to the Archbishop of Canterbury, concerning the Authorship of Iona Basiliks,' 8vo., 1837; 'Bishop Gauden the Author of Iona Basiliks' further shown, in answer to Dr. W. Watson,' 8vo., 1839; 'Life of Archbishop Cranmer,' 2 vols. 8vo., 1831 (an enlargement of the 'Vindication'); 'Authentic Account of our Authorized Version of the Bible,' 12mo., Malton, 1834. We have omitted a few theological papers of inferior merit, and the writings of the period in which he was also, in the early part of his literary career, a frequent contributor to the 'Gentleman's Magazine;' and he is stated in Hasted's History of Kent, to have assisted largely in the preparation of the 'History of England, as far as respects Archbishop Cranmer,' 8vo., 1827; 'Bishop Gauden the Author of Iona Basiliks' further shown; in answer to Dr. W. Watson,' 8vo., 1839; 'Life of Archbishop Cranmer,' 2 vols. 8vo., 1831 (an enlargement of the 'Vindication'); 'Authentic Account of our Authorized Version of the Bible,' 12mo., Malton, 1834. We have omitted a few theological papers of inferior merit, and the writings of the period in which he was also, in the early part of his literary career, a frequent contributor to the 'Gentleman's Magazine;' and he is stated in Hasted's History of Kent, to have assisted largely in the preparation of the

Adarcheson Todd, who was a Chaplain in Ordinary to her Majesty, died at Settrington, on the 24th of December, 1845. From his will, an abstract of which is given in the 'Gentleman's Magazine' for June, 1846, he appears to have left several daughters.

Adarcheson Todd, though the editor of Milton and Spencer, had no pretensions to either poetical talent or poetical taste; 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 disquisition. He is certainly not a very animated narrator; but his facts may generally be depended on. In 1822, as most of his notes, 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 Gentianaceae. It contains but one species, known as T. palustris, the only British species, has peduncles naked at the base, and is divided into two varieties. The flower buds 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 sepalis, afterwards slightly stalked with a slight lobe of the base of the stalk, but none under the perianth.

('Botting, Manual of British Botany.')
TONICS. [AMALCORTON, P. C. J.

TOMPAG. [SHJIT-BUILDING, P. C.]

TOPES. [AFRNICAN. P. C. N.]

TORDYLIUM (Cody. wounded or Discourages. S. 5), a genus of plants belonging to the natural order Umbelliferae. The calyx has 5 teeth; the petals are obvate, emarginated at the base, and rather small; the stamens are white, and laterally compressed; the carpels with prickly primary ridges, the secondary hidden by the numerous prickles which occupy the interstices; the flowers white, those in the side of the umbel unequal and sterile.

T. anthracis has bipinnate leaves, the leaflets ovate, lanceolate, inciso-serrate; the umbels on long peduncles, the leaves of the involucre oval-shaped, the fruit covered with bristles, the outer red, the inner white; it is native of Europe and Caucasia, and is plentiful in Britain.

T. infesta has an erect many-branched stem, the leaves bipinnate, the leaflets deeply cut, ovate, lanceolate. The fruit is densely prickly, the flowers small and reddish. It is found on fields and waste places in Europe and Great Britain.

T. pseudo has nearly sessile dense umbels, the outer carpels with hooked bristles, the inner generally covered with dense whitish shining granulations; the lower leaves are bipinnate, the upper ones pinnate; the leaflets deeply, narrowly, and anastomosing; it is native of Europe and the Levant, and is plentiful in Britain.

The seeds only require to be sown in the open ground.


TORTOISE-SHELL. This beautiful substance, or at least the best kind of the material which goes under the name, is procured from a marine tortoise called the Hawk-bill, or Témoine (P. C. N., [Harv.]. 76, 77], the Latin name of which is derived from the mode in which the scales upon its back are arranged, overlapping one another like the tiles upon the roof of a house, one kind of which were called by the Romans intestices. In most other tortoises the several scales of which their covering is composed adhere to one another by their edges, like inlaid work. Each animal furnishes thirteen principal plates, five along the centre of the back, and four on each side; and twenty-five smaller scales or plates, which constitute the margin of the shell. The size and thickness of the plates, observes Mr. Aikin, are more or less variable; and the Tortoise-shell, in the 'Transactions' of the Society of Arts, vol. iii., part ii., pp. 343-347, depend on the magnitude and age of the animal, a fresh layer being produced every year; and at the margin of the large plates may be seen distinctly the edges of the layers as they thin off in succession. Sometimes, however, he adds, large plates are met with, so thin as to consist, apparently, of only a single layer; and he observes that some of the dresses seem to be without effect and to be mere stipples. But in those thin plates are the produce of full-grown tortoises that have been stripped of their plates the year before, either purposely or by accident. Herring plates which constitute true tortoise-shell are separated from the common tortoise-shell by the large size of the shell or covering of the animal by the application of heat; the whole shell being commonly placed over a fire until the plates begin to start from the bone, and the separation being completed by the aid of a slender knife. The shell varies much in value, being frequently injured by barnacles, fragments, and other shell-fish, adhering to the tortoise while alive, and interfering with the preparation of the shell where play attack themselves. Occasionally plates of a uniform yellow colour are met with, and such, Mr. Aikin states, are in great request among the Spanish ladies, who require at least twice as much for a comb of plain tortoise-shell as for a mortice comb. The belly-plates of the tortoise are yellow, and sometimes they are found sufficiently clear for use.

The mode of converting tortoise-shell so nearly resembles the working of horn, described on pages 40 and 47 of this volume, as to need but little further notice; but owing to the very high value of the material (about three guineas per lb. was the price of fine shell when Aikin wrote in 1839), it is economised as much as possible. Before working the shell needs to be softened or tempered, which is usually done by dipping it for three or four minutes, or longer, if it is very thick and brittle, into boiling water. It should have a little salt mixed with it, because pure water absorbs much of the colour. Too much salt however renders the shell brittle; and too long boiling injures it by turning it nearly white, and covering it with opaque white film. According to Holstamphi, in whose work on 'Turning and Mechanical Manipulation,' vol. i., pp. 198-195, is a very full account of the handling of the tortoise-shell into various articles of taste and utility, some manufacturers flatten and temper their shells with hot flat irons, similar to those used by laundresses; the tortoise-shell is made somewhat slender, and, in the course of the operation, frequently moistened with water to prevent scorching. Holstamphi remarks that generally the less the shell is heated and pulled about the better, because from its apparent want of grain or fibre it is so to become brittle. Being also less fusible than horn, tortoise-shell cannot be made soft enough to be moulded without some injury to the colour; and accordingly, Aikin states, the manufacturers, at least in England, never attempt to produce tortoise-shell combs or other ornamented work, by the use of hot water to soften.

Such work is produced by pasting a piece of paper over the tortoise-shell, drawing the pattern upon it, cutting it out, with drills and fine saws, and, after the paper has been removed by steeping in cold water, finishing the ornaments with the graver. The cutting or parting of the teeth of combs by machinery is described under Coma, P. C. S., p. 185, but we may here mention another mode which is occasionally followed, and which illustrates the convenience arising from the flexibility of the material when warmed. A piece of tortoise-shell large enough to make two combs, with their teeth interlaced, or bent over in the same manner as the length of the teeth, to such a degree of convexity that they may be cut with a straight bow-saw without cutting through either of the edges of the pieces of shell, which are required to form the top or bottom of the portions of the comb, is flattened and the ends or points of the teeth are separated with a narrow chisel or prickcr, after which the combs are finished with files and scrapers, and bent to any required form. The same substance is also used for the same purpose in making the frames of earrings, which are usually formed of narrow strips of shell in which a brass or oval apertures, by the insertion of tapering strips of the required shape. The same yielding or flexible property is made use of in the manufacture of boxes; a round disc of shell being gradually forced by means of a mallet into the form of a circular box with upright sides. The union of two or more pieces of shell may be effected by carefully scraping the edges that are to overlap, in order to render them as smooth as possible from grease, even such as might arise from being touched by the hand, softening them in hot water, pressing them together with hot flat tongs, and then plunging the joint into cold water. In veneering with tortoise-shell, by which the work may be produced, it is usual to apply fish-glue, mixed with lamp-black, varnish, green, white, or other colouring matter, at the back of the shell, both to help it to stick, and to ensure permanency of the shell to the wooden foundation. In making knife-handles and other ornamental work metallic foils are put beneath the tortoise-shell, and the whole is fastened by an adhesive. Aikin refers to the luxurious taste of the Romans of the Anglian age for conches and other articles of furniture.
T A 6 8 T A

wended or in aid with tortoise-shell; and in Dr. Smith's
 Dictionary of Greek and Roman Antiquities," p. 585, it is
 stated that the name is sometimes called by Greek writers
 Ξανθός or ξάνθος, and in Latin testudo, because it was occa-
sionally made of tortoise-shell.

TOWNLEY, JAMES, REVEREND, the eldest son of
a well-known writer of the eighteenth century, was born
at Merchant Tailor's School, elected thence to St. John's
College, Oxford, and took orders. After having held two
lectureships in London, he was appointed, through the
interest of Lord Byron, to the living of St. Bennet's,
Gracechurch Street. Afterwards he was grammar-master in
Christ's Hospital, and in 1799 was appointed head master
of Merchant Tailor's School, and held that office till his
death in 1798, which happened soon after he had been
appointed to a living in Wales. He is said to have been
adored as a preacher: and some single sermons of his are
in print. But he is chiefly known on account of his intimacy
with Hogarth and Garrick. To the former he and Morell gave
material assistance in the composition of his 'Analysis of
Beauty,' and he got the credit of having much assisted the
latter in his dramatic works. The popular fancies of 'High
Life Below Stairs,' first played in 1759, was at length owned
by him. He was also the author of two other farces, which were
unsuccessful; but one of them, 'False Concord,' contains
beasts of various names, which were borne to be in a Glennis
and Colman's comedy of 'The Clandestine Marriage.'

The closeness of Townley's connexion with Garrick is further
evidenced by the fact that he received from Garrick, and held
Sweeney's comedy is not to be

TOXOTES, a genus of Acanthoperichous fishes of the
family Squamipennes, the species of which are remarkable
for having the power of spinning jet stream of water even to a
height of three or four feet with such accuracy of aim as to
bring down the insects upon which they feed from the aquatic
plants frequented by their prey.

TRACHILDES, the fourth family of heteromorphous
Coleoptera in Larratelle's arrangement of insects. The head
is more or less triangular or pedicel, and cannot be
retracted. They have soft bodies, smooth flexible elytra, often
showing the outlines of the segments, which are not hidden
on leaves and flowers. Many of them simulate death when
seized. Lagria, Pyrochroa, Mordella, Notoxus, Floria, and
Malery are types of tribes in this family.

TRADER. [Bankrupt. P. C.]

TRANSFER OF REAL PROPERTY. During the last
nine years various statutes have been passed for the purpose
of facilitating the transfer of Real Property.

The first of these was one passed in the 4th & 5th of Victo
ria, intituled 'An Act for rendering a Release as effectual
by the sealing of a Freehold Estate as a Lease and Release
by the same parties.' It enacted that every deed or instru
ment of release of a freehold estate executed after the 15th
of May, 1841, and expressed to be in pursuance of the Act,
should be established in all respects, as if the parties thereto had also executed the usual lease for a
year, providing at the same time that such release should
be subject to the same stamp duty as the lease and release
whereby a freehold estate is liable to under the Acts relating to the
Stamp Duties,

In consequence of the terms used in this Act, it was thought
necessary that all releases made under it should re
force the title in order to give them full effect. To obviate
the difficulties often arising from the loss of the lease for a
year, it was enacted by the second section, that the rectal
or mention of a lease for a year in a release executed before the
passing of this Act should be evidence of the execution of
such a lease for a year.

The next Act on the subject was the 7th & 8th Vict., c. 76,
intituled 'An Act to simplify the Transfer of Property.'
This Act having been found in many respects objectionable,
it was in the following year repealed by the 8th & 9th Vict.,
c. 106, whereby several of the provisions of the former have been retained, and which contains an improved formula.

This Act is intituled 'An Act to amend the Law of Real Property,' and, as its provisions will have a great effect upon the Transfer as well as the Law of Real Property, it will be necessary to consider them at large.

After repealing all the clauses of the former Act from the 1st of October, 1845, except those which related to contingent
remainders, which were repealed as from the commencement
of the former Act, it provides: That after the 1st of October,
to Remainder, P. C. The practical effect of this section will be the omission in settlements of the limitations to trustees for life without remainder. By sect. 9, where the revision on a lease shall, after the 1st October, 1845, be surrendered or merged, the estate which shall for the time being consist of a leasehold estate vested right to the estate, for the purpose of preserving the incidents to and obligations on the same revision, which, for the surrender or merger, would have subsisted, be confirmed by the same or other description of this section is to do away with the rule that the covenants of and remedies against a lessee, and the obligations on the lessor, being incident to the immediate revision, cease as regards the land on the merger of that revision in another estate.

In the 8 & 9 of Vict. two acts were passed which had for their object the reducing the length of conveyances of property and leases. The first, the 8 & 9 Vict. c. 119, is entitled 'An Act to facilitate the Conveyance of Real Property;' and the second, the 8 & 9 Vict. c. 124, 'An Act to facilitate the granting of certain Leases.' The provisions of the two acts are analogous, and their place is that of providing, that where the words in the first column of the schedule attached to the act are used in a deed, they are to have the same effect as if the words in the second column had been employed. But an omission here lies in the short clause, and in the second the long covenant for which the first may be substituted. The acts also contain provisions for making slight alterations in the wording of clauses according to the case. It seems doubtful whether these acts will be of much practical application.

All the acts here considered relate to England and Ireland, but not to Scotland.

TRANSPORT, RAILWAY. In an article intended to be supplementary to that given under RAILWAY, P.C., pp. 245-257, and to treat especially upon matters which have risen into importance during the six years that have elapsed since that article was written, many topics which seem to claim attention must be passed over, or treated very briefly. Except in the simply historical portion of the subject, almost every part of the present article is referred to the provision as to what 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, whence it is rapidly extending over the whole face of Europe, and of the civilized world. To facilitate reference we shall, as far as the natural dependence of one subject upon another will allow, follow the order of arrangement adopted in the article RAILWAY, so that the reader may see at a glance the connection of the original and the supplemental matter. The principal deviations from this course are in the bringing together, under the general head of 'Railway Companies,' the matters relating to the obtaining of railway acts, originally noticed under RAILWAY, pp. 251, 252, and such as relate to railway 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 note of the Government. There are two opposite principles of administrative policy which may be pursued in reference to undertakings of public utility. By 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 give or withhold the legal powers necessary for their execution. It is not our purpose to discuss whether the spirit of commercial enterprise very active, the former principle is often essential for the promotion of public works, and it has accordingly been adopted by the governments of France, Belgium, and the United States, and in the works of the mines 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 interest. The circumstances of this country, therefore, would naturally have dictated the policy of permitting the employment of capital in the undertaking; but, in the event of it being done as much as possible; and our free institutions, and the generally passive character of our government, have favoured politically a principle which would have the effect of making the expedient. It may be doubted, indeed, whether this principle would have 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 undertaken 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 overcoons or conciliated, the bill was passed through Parliament; but if not, the company would have power to acquire the lands by the purchase of them. But there were no competing lines, no means were taken by Parliament to inquire whether the line was the best that could have been suggested for the district through which it was intended to pass; but evidence was taken that the bill was given the slack was held to establish the public utility of the undertaking; and it was authorised. The executive government took no part in the investigations, and Parliament, on the support of members locally interested can scarcely be said to have inquired into the merits of lines except when an inquiry was forced upon them by the opposition of private parties. Little or no security was taken for the public interests, 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 imposed no limitation upon the charges for the conveyance of goods and passengers. As the companies undertook the entire traffic of their own lines, no tolls were payable, and thus the maximum, which was intended for the security of the public, was wholly imperceptive. This oversight has since been rectified, and every railway act of 1845 and 1846, for a new line or for the amendment of acts, under which existing lines were constructed, contains a clause which reserves to Parliament the right of revising the fares and charges; and in most of the recent acts the maximum charges are moderate. In 1836 committees were required to give more detailed reports concerning the bills committed to them, and to make out their proceedings upon the original papers in a form rather than in substance. In 1839 the constitution of the committee was improved by the admissibility of ' selected members,' who were not locally interested; and in 1844, 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 vacillating forms of procedure, and by ill-regulated and too often incompetent tribunals.

But notwithstanding admitted defects in the system of railway legislation, and the abuses which have arisen from it, the principle of allowing free competition to the spirit of enterprise and capital has been eminently successful, and more railways have been constructed in the last fifteen years, and more science and skill have been devoted to their improvement, than a government could have called for 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 transportation, 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 brought to 50 per cent. and strictly, have already continued in being for some years, and are undoubtedly necessary for the proper working of the system. The provisions of the act were mainly directed to the establishment of 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 selfish, profit-making desires of those companies which had been granted special privileges by parliament, in perpetuity, to railways and the like. The act secured the portion of this revenue, and upon such conditions as may be contract for by the secretary at war.

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Annual profits divable 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, and charge such tariffs to profits to 10 per cent.; with a guarantee, however, that 10 per cent. should be made good to the company, and that without their consent no further revision of their charges should be made for twenty-five years. But at the expiration of the twenty-one years, the Treasury may purchase any such railway, in the name and on behalf of her Majesty, paying within three months' notice, and on the basis of 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 effect 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 of 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 ensure the means of travelling by railway at moderate fares, in carriages protected from the weather, it was enacted that every railway company incorporated in the session of 1844, and within which a large portion of 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 interests, it was provided that no carriage or conveyance is quite entitled as regards the public interest, or as regards the freedom of capital.

Having stated these general principles in reference to railway legislation, we may proceed to a brief analysis of the various measures which have been passed, 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 (3 & 4 Vict. s. 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, and to take any by-law should be submitted to the Board, which may disallow them. These and other matters provided for by this act, at once disturbed the independence under which the railway system had hitherto grown up, and placed all railway companies 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 order, in the opening of stations, and the setting of lights, and in general, as not considered safe by their inspectors: notice of accidents attended with serious personal injury was to be given to the 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 become common terns, or using a portion of the same line of track 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 regulations. They were also authorised to enforce the alteration of level crossings which appeared to endanger the public safety.

The same act required all railway companies to convey Baggage, Luggage, Messengers, and the Police at such rates, and upon such conditions as may be contracted for in the manner prescribed.

In the case of the railway where such a rate is fixed, the duty upon passengers conveyed by railway is chargeable at the rate of 5 per cent. 'Up on all sums received or charged for the hire, fare, or conveyance of such passengers.' The amount paid by the several companies from the 1st September, 1845, to 1st July, 1846, was £4,884 8s. 8d, and the amount not charged on account of this exception of third-class passengers, was £21 13s. 3d. in all, at such rate or at such rate as the Board may direct.

By an act of the 1 & 2 Vict. c. 98 provision had been made for securing advantageous arrangements upon railways for the conveyance of the 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 every commissioned officer proceeding on duty to be conveyed in a first-class railway carriage, or at least in a second-class carriage. 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 companies are required to convey military stores, baggage and arms, at 2d. a ton per mile, the assistance of the military in the settlement of which is necessary in case of an
arson, powder and other combustible matters at such prices and
under such conditions as may be contracted for with the secre-
tary general.

It was also enacted that every railway shall be bound to allow
a line of electric telegraph to be laid down for her major-
stasy's service upon lands adjoining the railway, and to give
every facility for conveying messages and telegrams. Such
powers were not otherwise than absolute, and the civil
powers upon the company and by the company upon share-
holders, and the recovery of damages and penalties. By a
similar act (c. 17), the sale of all lines of railroads was ex-
dated with respect to all companies incorporated for carrying
undertakings of a public nature in Scotland.

This is the 'Railways' Clauses Consolidation Act' (c. 18),
by which are amalgamated all previous enactments which
in acts authorizing the taking of lands for undertakings of a
public nature. It provides for the purchase of lands by agree-
ment, 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
purposes was passed for Scotland (c. 19). These acts also
are applicable not only to railways but to all other un-
der takings in which compulsory powers of taking land are
necessary.

The last 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 con-
struction of the line and the works connected with it, to the
operation of the line during the progress of the works, the con-
pensation of land during the process of the works, the crossing
of roads, the construction of bridges, and the works required
for the protection of the surrounding lands, and also regulations
which regulate 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 repealing 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 as jealousy, as being liable to
lead to an amalgamation of lines, for which separate acts have
been passed, without the distinct authority of parliament be-
ing obtained, in each case; an Act (8 & 9 Vict., c. 96) was
designed, 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 the effect and purpose that the
railway to be leased, sold, or transferred, and the company or
party by whom such lease, &c., may be made, granted, or ac-
ceded.

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 with other objects, had a
bearing on the railway powers and duties, and was of
importance in connexion with 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 advertise-
ment, 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 busi-
ness, 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 of the subscribers; and a copy of the
prospectus itself before it is circulated. Where the company
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 subscrip-
tion lists, and allot shares and receive deposits not exceeding
eight years, for £100, and such further deposit as may be
required by the registrar, after which they 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 registrar a copy of the Parliamentary Contract, and the 'Subscribers' Agreement, together with certificates of the deposit, at the proper offices, of the shares, bonds, debentures, and other securities. When the certificate has been obtained, the promoters may use the name of the company 'registered,' may have a common seal, may use and be used 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 the Houses of Parliament, and apply for bills to incorporate them and authorize their undertakings.

In the session of 1846 several acts were passed affecting railways. The first (9 & 10 Vict. c. 20) introduced and approved method of effecting the deposits of moneys required by the standing orders of Parliament, to be deposited by the subscribers to undertakings; and granting privileges, imposing 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 market which were locked up profitably in the hands of the accountant-general of the Court of Chancery, and were not very readily invested in government set series.

The second (9 & 10 Vict. c. 28) facilitated the dissolution of railway companies which had not on the 3rd of July, 1846, obtained acts of parliament to authorize their undertakings, and had the form and arrangements 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 1500l. and two unpaid commissioners. The president is to be appointed by the Lord Chancellor, and the commissioners, all and by ballot in Parliament; but the two paid commissioners will be disqualified.

In addition to the ordinary power 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 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.

Though not directly applicable to railways, may here be cited. By one the ancient law of deodands was abolished (9 & 10 Vict. c. 63); and by the other a mode of recovering compensation where death is caused by accident. In such cases, compensation is to be brought by the executor or administrator of the deceased, for the benefit of the wife, husband, parent, and child; and the damages which may be recovered from the parties by the deceased, if an accident was caused, are to be divided amongst the several parties in such shares as the jury shall direct. (9 & 10 Vict. c. 53.)

This is assuredly a wise amendment of the law, as it substitutes a compensation to the relatives of the deceased for a deodand upon the engine or carriage, which is paid, as chance may determine, to the lord of the manor or to the crown.

These are the several statutes relating to railways; and a few results 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 may arise. To this end, the members of the Department were originally confined therefore to the general supervision of railways already authorised by Parliament; and although railway bills were sent to the Board of Trade, it was not competent for the Department to take any 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 1846, 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 out of Parliament, and submitted to Parliament, was adopted by Parliament merely as a means towards the formation of its own conclusions. 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 between London and the north 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 introduction of any such schemes into Parliament. The Department had expressly declared that the reports of the railway department would in no sense be conclusive of the merits of the several schemes submitted to it, but that they would be regarded by parliament merely as aids towards the formation of its own conclusions (5th Report, p. xvi.): but the publication of its decisions in the Gazette, and the authoritative character of its opinions, and the reports produced a very general impression that it had been invested with much greater authority than it really possessed, and that its adjudications would be acknowledged by parliament as final. On the meeting of parliament, however, in 1846, this opinion was very soon discovered to be erroneous, and conclusions of the House of Commons proceeded with the investigation of the several bills very much in the same manner as if no reports had been made to Parliament.

In many cases their decisions may have been influenced by the reports of the Board of Trade, but the reports themselves, though ably written and often of the highest value, were not founded upon a public examination of the schemes, and a full hearing of the parties, and on 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 whatever, less strong and irresponsible than parliament itself, could at that time have withstood the powerful influences of railway companies and speculators. At all events this experiment of the railway department was abandoned, and 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, and that the board is no longer liable to the Commissioners of Railways; and it is most probable that the expense of regulating the merits of railway schemes, which failed before, may now be revived; but under the act it will be confined to such cases as have not been the subject of legislation, or in which the crown or any other House of Parliament, or 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.

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allowing a nearer adherence to the nature, 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. The Lancaster and Carlisle and the Liverpool and Manchester Railway are instances of its success in the country where, notwithstanding the introduction of gigantic engineering works to improve the gradients, several long and steep slopes occur, are cases in point. On the Carlisle line especially very formidable slopes were found unavoidable, those between Beattock and the summit of the Clyde pass, a distance of nearly 14 miles, averaging 1 in 65, and containing an ascent of 1,000 ft. per mile. These having proved, in the view of the Great Eastern Railway, a branch of the South-Eastern Railway is another example, upon 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 districts many cases are cited in proof of the assertion that such roads as the everlasting inhabitant of the country might adopt 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 ago altogether impracticable are now successfully negotiated. In all these cases cited are the inclined planes on the London and Birmingham Railway, from the Euston Square station to Camden Town, rising in some parts at the rates of 1 in 65 and 1 in 75; that by the Great Western Railway connecting Highnam to Gloucester, with the Victoria station at Manchester, rising 1 in 59 for 1000 yards and 1 in 49 for 640 yards; and that by which the Edinburgh and Glasgow Railway is connected into Glasgow with the Great Western Railway at 1 in 62 for 15 miles, 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 might be worked more efficiently and more conveniently by locomotive engines. The Lickey incline, on the Birmingham and Gloucester Railway, is likewise referred to as a conclusive proof that a gradient of 1 in 574 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, 'presents cases where the plans and sections of the inclines, the ascent and descent of curves, of every degree of curvature, up to 8 chains radius, and with steep inclines, being worked with economy and safety; and, among other cases, there are upon the Manchester, Leeds, and Carlisle Railway, one (Plan 2) of (plains yards) radius, away from any station, and in a gradient of 1 in 82, over which their trains have been worked for upwards of four years, without the slightest accident or practical inconvenience.' Special precautions are, however, adopted to prevent danger; the engine-drivers being warned by inscribed boards at the side of the railway to shut off their steam on approaching the curves referred to.

As connected with the design of a line of railway we may further observe, that surface-crossings have been allowed much more extensively in recent railway acts than in those of 1825 and 1830, because there was a great saving of line by using one. After the great period of railway speculation in 1830 and 1837 the degree of uncertainty which yet remained respecting the remunerative character of railways, combined with the enormous excess in the cost of most of the lines in progress above the parliamentary estimates, and with some other circumstances, almost put a stop to the commencement of any new schemes; and when at length, in the sessions of 1842 and 1843, symptoms of revival began to appear, the new schemes brought forward were mostly under a guarantee from some established company, and were, almost without exception, distinguished by features calculated to reduce the cost of construction, in every instance except that of the adhesion of the earth-works by the adoption, as above explained, of comparatively steep gradients. This peculiarity, by keeping the level of the railway nearer to the natural surface of the ground, led necessarily to the more frequent use of surface-crossings; because the economy of construction aimed at would have been neutralised if, as most often has happened in a level country, the roads crossing the railway had to be raised or lowered, and passed by means of bridges. These principles of cheap construction were very closely canvassed and decided on at the Old Court, on thexee of the London and Birmingham branch. The Northampton and Peterborough branch from the London and Birmingham railway; and having been sanctioned by parliament in that case, were soon applied to several other lines, for which acts were obtained in 1844 and 1845. Most of the lines thus projected for working with a single track either have been or are likely to be doubled, the increase of traffic and the necessity of having a single track for such a measure necessary; but their other peculiarities remained, as, and have been largely imitated in the new lines sanctioned in 1846, upon which surface-crossings are very numerous. Wherever this mode of crossing is allowed, the gates are kept shut across the road, excepting when opened by an attendant, so that the danger occasioned to trains upon the railway is exceedingly slight.

**Permanent Way.**—In the construction of the upper works of a railway, to which this name is given, more extended experience appears to be leading engineers to a greater uniformity of practice than prevailed when the F. C. article, which the present writer had the pleasure of contributing last year, was written. The principle of affording continuous support to the rails by means of longitudinal timber bearings, although still adhered to by Mr. Brunel, and employed upon lines in connexion with the Great Western and Great Eastern railways, is now followed by the majority of other engineers; it being found that their use involves some loss of engine-power, probably from the greater yielding of the road, occasioned or favoured by the actual lightness of the rails as compared with those of the earlier systems, and also by the action of the treads and by the comparative weakness of their form. This peculiarity has been ingeniously turned to advantage by Mr. Brunel in the descending track in the Box tunnel, upon the Great Western Railway, for the proposed additional line between Wiveliscombe and the West Country, where it is stated in the Parliamentary evidence that the line is particularly subject to the action of rain, the hill being covered with thick grass; that by installing the railway in the Box tunnel, upon the Great Western Railway, for the proposed additional line between Wiveliscombe and the West Country, where it is stated in the Parliamentary evidence that the line is particularly subject to the action of rain, the hill being covered with thick grass; there is a decided preference for the cross-sleepers, which, it is observed, in the case of many railways, the incline, the treads, and the comparative weakness of their form. On the Hull and Selby (narrow gauge) line, which was partly laid upon longitudinal timbers and partly upon transverse wooden sleepers, a good opportunity was afforded for comparing the two classes. In the Bearhull tunnel, Mr. Gray, who was formerly locomotive superintendent upon that line, shows a decided preference for the cross-sleepers. He observes that there was a great difficulty in keeping the rail in perfect contact with the longitudinal timbers; that they require to be pressed upon the timber with a constant pressure nearly equal to that coming upon them during the passage of a train; and that in the absence of such a pressure, which is unattainable by any mode of fastening now in use, water gets in between the rail and the timber in wet weather, and is forced out with great violence during the passage of an engine; each wheel carrying it out against the timber; '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 were 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 approaching, he found, on reaching the incline, which was laid with cross-sleepers, that the train '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-
fusal timbers, the construction has been found so unsatisfactory that, in the •writing, it is nearly impossible at the time we write (November 1846), heavy bridge rails, laid upon cross-sleepers, have been employed.

The kind of rail now most commonly employed resembles the one described in the first inserted extract 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 75 or 76 lbs. per yard. In some cases heavier rails have been used; the heaviest yet employed, we believe, being those laid on the Great Southern and Western (of Ireland) Railway, between Dublin and Carlow, by Sir John Macnelli, which weigh 90 lbs. per yard. These rails however are laid in a peculiar arrangement, and are not the subject of the present notice, of which the natural tendency is to attract the material to decay. The permanent way of the South Eastern Railway, laid under the superintendence of Mr. Wiliam Cubitt, is an excellent example of the cross-sleeper construction, which has been adopted on the Continent and in several other railways. A minute account of this permanent way, communicated by Mr. Pope to the Institution of Civil Engineers, was printed in the Civil Engineer's and Architect's Journal, for June, 1842, pp. 299-302, which, as well as a shorter notice in the Railway Chronicle for 1846, p. 209, is illustrated by engravings of the mechanical details. The rails, which are washed of a regular triangular section, 9 feet long, 11½ inches broad, and 7 inches deep, formed by sawing square baulks of Baltic fir diagonally into four pieces. These are laid with the broadest flat surface (the base of the triangle) uppermost, the double slope of the under side constituting a form admirably adapted for bedding itself well in the ballast. The chairs, which are of a pattern patented by Messrs. Ramsone and Macnelli, are of a shape yet to be seen in this country, and are devised to keep the track in the straightest line and to ensure the greatest strength from a given weight of iron, and have a single projecting rib or buttress in the centre of each chair, which is cast and left in the case of the original of sufficient size to secure the sleeper by two pins, one at each end, the holes to receive them being formed alternately on opposite sides of the medial line of the chair and sleeper, that the driving 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 trentls of compressed oak, 6 inches long, and tapering from 1½ inch to 1 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 of the chair, and so arranged that the true centre of the sleeper of the rail, and its steadiness in the chair, may not be affected by any trifling irregularity of shape; and the rails are secured in their place by keys of compressed oak. Upon the South Eastern line the rails weigh 76 lbs. per yard, the ordinary chairs 20 lbs. each, and the joint-chairs 28 lbs.; and the chairs and sleepers are placed at an average distance of 3 feet from each other. The first freight train, in each section, is placed at a distance of 2 feet 6 inches to 2 feet 8 inches, while the intermediate space is divided into three equal parts. Upon the Croydon line rails weigh 75 lbs. to the yard, and the ordinary chairs 20 lbs., joint-chairs 30 lbs., and six, instead of five, sleepers to the 16-feet rail.

A communication made by Mr. W. H. Barlow to the Institution of Civil Engineers on the 14th of January, 1845, and printed in the Appendix to the Institution for that year, p. 24, treats of the kind of hollow or tubular key of wrought-iron, made to press equally against the jaw of the chair, the middle web of the rail, and disposed at both ends, for the purpose of substituting for the compressed wooden keys so generally used; which, from their position just above the surface of the ground, are much exposed to decay, and are also liable to be injured by the driving of the sleepers to their settle by the chink or smite. On the Midland Counties Railway the wooden keys have not been found to last more than about five years; and as they cost from 8d. to 10d. per 1000 (upwards of 7000 being employed in a mile of railway with double twelve, or 3 feet apart), the expense of renewal becomes an important item.

In addition to the evidence before the Gauge Commissioners, already referred to, which is well worthy of diligent perusal for its information upon this and other branches of railway engineering, the reader may consult with advantage the reports given in the 'Civil Engineer's and Architect's Journal,' of Mr. Vignoles's lectures, delivered when professor of civil engineering at University College, London, and which, reported in the number for September, 1845, pp. 319, 313, relate solely to the permanent way, or upper works of railways.

Gauge.—It has been stated under RAILWAY, p. 256, that the gauge, or width of track, upon the Liverpool and Manchester railway, which subsequently became the model for other lines, was copied from some of the colliery railways in the North of England, and this arrangement has been found amply sufficient for mineral traffic, allowing as it does, by the projection of the body over the wheels, the use of carriages to the full as large as any employed upon common roads. The gauge was laid down before it was determined by what power to work it, so that, although practical experience might have been cited in proof of the sufficiency of a smaller gauge for the use of locomotive engines, the gauge appears to have been adopted for the sake of convenience, without reference to the motive power. Soon however, after the successful application of locomotive engines to the attainment of a high rate of speed, the gauge thus insufficient for locomotive engines, the gauge was considered as too small to allow of the safety of running them under the weight of a train, and the whole matter was referred to the Railway Commission, for consideration.

It became a favourite idea with many engineer-builders, that a few additional inches to the gauge would increase the power, and in every way much improve the locomotive; while others, considering that all railways must eventually communicate, applied themselves to simplify the engine and adapting it to the gauge; and, he adds, 'even up to the present day, the question is, shall the engine be adapted to the gauge, or the gauge to the engine?'

The railways which were projected in immediate connection with the Liverpool and Manchester adopted its gauge, as may be first contemplated for the Great Western Railway, which, as originally projected, was to commence by a junction with the London and Birmingham line a few miles from London. As, however, it ran into an entirely new district of country, and one in which the lines of a very superior order were attainable, it was determined, upon the recommendation of Mr. Brunel, to seek for an independent entrance into London, and, by the adoption of a wider gauge, to aim at a higher degree of speed, and a higher accommodation than any other line could afford. It was then believed that each main-trunk railway would continue in a great measure independent of each other, and therefore that no serious difficulties would arise from the diversity of gauge, and Mr. Brunel conceived that by the adoption of a gauge of 7 feet instead of that of 4 feet 8½ inches, he should be able, by increasing the bodies of the carriages between instead of over the wheels (a construction, we may observe, which he has not tried, and against which several important reasons might be urged), to save friction by the employment of larger wheels, which, without this, would be of a gravity higher than in ordinary railway carriages; that he should thus also ensure greater stability and a more steady motion; that he should be able to convey more passengers and other common road carriages than could be by any other means; that he should obtain facilities for the adoption of larger and more powerful engines than had as yet been used upon any railway; and thus, by a combination of mechanical facilities, he was able to make the advantage of the superior levels of the line for the attainment of very high speed.
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 1858, Mr. John Corbet, the Great Western's experienced engineer, was called in to examine and report upon the works of the Great Western line, which was then completed as far as Maidenhead, especially in reference to the increased gauge. The result was that the broad-gauge, as it was called in the narrow-gauge, did not lead to any change in this particular, and consequently the construction of the Great Western line, with its extension to Exeter, and its first important branch, the Great Western and Northern Counties limited line, was carried forward upon the 7 feet gauge. In the mean time the Eastern Counties railway, another line which was then expected to continue in a great measure isolated, was, upon the recommendation of the Board of Trade, in 1859, examined and reported upon by an expert committee appointed for the purpose, and the conclusion arrived at was that the 7 feet gauge was equal to the 10 feet or broad-gauge, and the question of the 7 feet gauge was consequently abandoned. The immediate result of this was the great advantage which the 7 feet gauge was to the London and South Western Railway, which at that time was on the 7 feet gauge. That line, in consequence, was able to carry by a large margin the traffic which the Great Western had sought to divert to its broad-gauge line, and, of course, was able to realize a commercial success which, had the Great Western been allowed to carry on its way, would have been equal to that of the South Western Railway, from the fact that the profit of the Great Western was equal to, and at that time exceeded, that of the South Western. The result was, however, that the Great Western lost a large part of its traffic, and was, throughout the remainder of its career, discontented with the decision of the Board of Trade; and, in this connection, it is interesting to note that the Court of Arbitration, in awarding the Great Western the damages which it claimed in reference to this decision, decided in favour of the Great Western Railway Company, and awarded it damages of £30,000, in addition to the costs of the action. This decision was, however, reversed by the Court of Appeal, and the damages awarded to the Great Western were reduced to £10,000.

In the parliamentary session of 1845 the gauge question assumed great prominence in consequence of the obstinate contest then carried on between the broad and narrow gauge interests for the privilege of constructing lines between Oxford, to which place the Great Western company had a broad-gauge branch formed under an act of 1843, and Rugby on the one hand, and between Oxford and Birmingham on the other, which was then under construction. The Board of Trade reported against the broad-gauge lines mainly upon the ground that an extension of the broad gauge into a new district of such importance was objectionable, both from the point of view of the traffic, a much larger number of the stock would be required, and the belief that the broad gauge would be more injurious if carried into the interior of the commercial district than if limited to the port of Bristol (it being then proposed to reduce the Bristol and Gloucester line to the narrow gauge), and the junction at Oxford. Parliament, however, finally determined in favour of the lines promoted by the Great Western company, chiefly upon the ground of their engineering superiority, but without expressing any decided opinion upon the question of gauge, which had, by this memorable contest, assumed a national importance. Indirectly it led to a full investigation of the question in the House of Commons, and an address being, before the close of the session, presented to the House of Lords on the motion of Lord Dalhousie, and in the House of Commons by the motion of Mr. Cobden, for a royal commission to inquire and report whether in future private acts for the construction of railways ought to be made for securing a uniform gauge; and whether it would be expedient and practicable to take measures to bring railways already constructed, or in progress of construction, into uniform gauge. The commissioners appointed in consequence of this motion were Colonel Sir Frederic Smith, of the Royal Engineers, who had for some years been connected with the Office of Inspector-General of Railways under the Board of Trade; Mr. Pollock, of the Worcestershire Military Academy, who had some years before been upon the Irish Railway Commission; and Professor Airy, the Astronomer-Royal. After a careful investigation, in the course of which many experts examined, experiments were tried upon both gauges, and important statistical returns were obtained from the various railway companies, these gentlemen, in January, 1846, made a report in which they unreservedly pronounced in favour of the 7 feet gauge, on the ground that, in fast or express trains than by any others, much persons being seldom encumbered with much luggage, and no carriages or horses being, under ordinary circumstances, conveyed by such trains. But with respect to local traffic or for comparatively trifling distance, confusion, and personal discomfort, with some risk of loss of luggage during the transfer. In the case of ordinary or mixed trains, which convey many more passengers, and a much larger quantity of luggage, the evils would be much more serious. Experience shows how greatly those trains are preferred in which, although the traveller may have to pass over the lines of different companies, passengers may be conveyed from end to end of the journey without change of carriage; and many companies meet this preference, and the desire to have luggage undisturbed, by an arrangement of the line, bringing them hack empty. The transfer of carriages and horses involves also much delay, and in the case of many horses, danger also. With reference to such trains the commissioners observe that 'the change of one line of road for another, in the transference 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 remove or mitigate such an evil.' With reference to goods trains also, the evidence of carriers was very decisive as to the evils attending any such disturbance and re-arranging as must take place on such a set of trains. And, in such an event, the evidence shows that the inconvenience, if any, was trifling, and the working of the lines of one company running upon the same line, would be little disturbed, and the carrying of goods by passenger trains was found to be far more formidable.

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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 reference to the policy of establishing uniformity of gauge it is interesting to examine briefly the opinion of ordinary and professional men as to the conviction that the time has arrived when, if steps cannot be taken to remove the existing evil of diversity, it appears at least imperative that the wider spread of the evil should be prevented. In the question proposed 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 different systems which now remain, England, 'the nation of four gauges,' and for that reason the greater superiority of one over the other, their adaptation to the wants of the country, and the possibility as well as the policy of a change, but also the pecuniary means of effecting it.' Another view of the subject relates to the expediency of laying additional rails to enable carriages suitable for both gauges 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 stations would be very likely to affect the speed and safety. If this were 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 two additional rails were used the expense would be great, 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 a broad-gauge and a narrow-gauge line, with two trains running, if between the two running stations, 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 that in the event of any accident or obstruction to traffic, the attendants of the 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.

After the question, so far as regards the question of the accommodation of a comparatively small number of persons, however desirable that may be to them, of as far less moment than that of affording increased convenience to the general commercial traffic,' they considered the narrow gauge preferable for public convenience, and, were it imperative to produce uniformity, would recommend the alteration of the broad to the narrow gauge; especially taking into consideration 'that the extent of the former at present in works is only 274 miles, while that of the latter is not less than 1901 miles,' and that the alteration of such lines would require the expenditure of much money. The objection of theRICS that accidents which cause such evils were more likely to occur on the greater trunk-lines ' of railway, such as are now in practical operation, 'a superiority were due to the broad-gauge system, that superiority would be less for lines yet to be constructed: a small improvement in the present lines, and any consideration of preferrence 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 stating that 'the evils which have been generally attributed to the narrow gauge, with well-proportioned engines for traffic, and yet in general these are judged commercially to be less costly, as well as the less difficult operation.' The question of an intermediate gauge is treated very briefly by the Committee of Inquiry. There is evidence obtained to the efficiency of the 4 feet 8½ 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 6 feet, 5 feet 6 inches (which, upon the recommendation of the Board of Trade, had been previously determined as the national or standard gauge for Irish railways, 6 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 be enormous, and that they could not recommend any such 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 that the scheme of 4 feet 8½ inches, which has been adopted by the legislature to be the gauge to be used in all public railways now under construction, or hereafter to be constructed, in Great Britain; that no subsequent alteration of such gauge would be necessary to the present line, the question of the speed of railroads for the general public, and the measures be taken to complete the general chain of narrow-gauge communication from the north of England to the southern coast; and that to avoid the evils of breaking gauges at the junctions, the gauges of the various lines can be taken along sharper curves than would be suited to a broader wagon; and are therefore more suitable where, as is often the case in such districts, the broken nature of the ground renders
on the narrow gauge, with the existing broad-gauge railways, some equitable means should be found of either producing entire uniformity by the reduction of existing lines, 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 a pamphlet in support of the motion of the members of 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 comparatively new department. Nevertheless, the report of the broad-gauge party, and to those who had made 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, Observations on the result of the inquiry of the commissioners of 1846, for the accommodation of all the persons, and at a late 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 entertained the stamp 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, from cities, towns, or places of in the year 1846, to Rugby and Wrexham, and into South Wales; and also in the country lying to the south and west of the Great Western and Bristol and Exeter lines, connected by the use of extensions 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 may be obtained in a future session.

It is felt by many who have deeply 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 proponents 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 relative proportion and contemplated ultimate breadth of the railroads 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. Provisions have been made for the construction of narrow-gauge lines, 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, of the necessity for the provision of their own interests as well as of the convenience of the public, of reducing their gauge to the national standard.

The second point is which we would 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; which points have been fully considered by the commissioners, but in reference to another feature involving the comparative merits of the gauges themselves. Admitting, for the sake of argument, that the broad gauge does offer greater facilities for conducting a very extensive traffic, which may be advantageously concentrated into heavy trains, it is well to bear in mind that the tendency of the numerous competing lines now in progress for the accommodation of heavy traffic, by the use of extensive trunk lines, is to promote and render necessary the subdivision of traffic into small rather than its concentration into large trains, in order that the local traffic of such numerous lines may be employed to the utmost, to the injury of the passenger or freight traffic, and by the lighter trains calling at numerous minor stations. All these considerations point towards the peculiar facilities of a narrow gauge as prospectively more desirable than the power of moving large numbers of passengers or goods has been proved injurious in an 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, while it might be difficult to say that any particular accident which has happened upon a broad-gauge line might not have occurred had the gauge been narrower, the increased width in may in many cases be seen to be 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, increase the injurious effects of that almost irresistible motion. While it is easy to point to lines, and within which gives so fearful a character to many railway accidents. The greater length of the axle, although accompanied by increased tendency, increases the probability of fracture, or of such straining the rails, and the wheels, as which give the view, and under ordinary circumstances, this evil is aggravated by the use of large wheels, which, when their flanges come in contact with the rails, act upon the axles with greater leverage than small. It is well known that the 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 damaged by a heavy than by a light engine, we cannot avoid the conclusion that the large and heavy engines with advantage. With regard to the line by the failure of axles are considerably augmented by
ero company, its uniformity 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 tramways are usually narrower than the common narrow gauge, 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 variety of gauge pleaded, that as branches and connecting lines multiply, the advantages of running a line in which continuous running by a single way extended, without being required to change their carriage; and that a similar principle must pervade the arrangements for working every description of through-traffic if the public is to be conciliated, and the usefulness of the railway system developed to its full extent. The importance and at the same time the difficulty of carrying out these principles became still more obvious when the lines extending from Rugby and Hampton to York were completed. For some time, however, discussions arose between the different companies; it was difficult to obtain accurate returns of, and payment for, the use made by the several companies of one another's carrying arrangements; and in a proper way, it is supposed by those companies, and are wagon-loads 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 principles of the Clearing-house by which the business of the London bankers is so materially facilitated. [BARK, P.C., p. 365.]

After some difficulties the proposed system was, on the 2nd of January, 1842, brought into operation on the railways extending from London to Darlington in one direction, and from Manchester to Hull in another. It has been since adopted by the companies whose lines extend from Darlington to Carlisle, Sunderland, Hartlepool, and Scarborough; and from Manchester to Liverpool, Fleetwood, Lancaster, and Manchester.

'In a few months,' according to the pamphlet above quoted, which does not allude to the probable further extension of the north of Scot-

land, and to other objects, and it grants leave to any line to be extended, it will be in force on all the railways included in the area defined by a line passing from London through Glasgow, Liverpool, Fleetwood, and Glasgow, to 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 lines that are beyond the limit described; 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 different gauge.

One of the principles of the Clearing-house system, the regulations founded upon which are very rarely departed from, is, that passengers shall be booked through at all principal stations, and conveyed to their destination without change of carriage; that the journey be in one way carried through without change of conveyance, and goods without being shifted or re-assorted; that the company shall pay a fixed rate per mile for such carriages and wagons, not their own property, as they may need; and, a further sum per day by way of line or demurrage for detention, if kept beyond a prescribed length of time; and that all carriages be booked between the several companies shall pass through the Clearing-house. Without entering 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 give to all the connected railways of Great Britain, as far as each is connected with the through-traffic, the character of one concern, conducted on a uniform system, we may state that the tables appended to the pamphlet show that in the year 1845, 517,886 passengers were conveyed in average distance of 144 miles, while the average length of the railways upon which the system is in operation being only 41 miles, each travelled on an average over nearly four different railways, and passed three junctions, without any notice of necessity, and at the same time these passengers, 59,765 railway carriages and 5813 trucks with private carriages were sent through. The tables further show that the endorsement of goods for the conveyance of coke, coal, and other minerals, of which no record is kept at the Clearing-house, 180,606 wagon-loads with merchandise were sent through in a similar manner.

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 moveable rails is concerned; but one of the most important precautions attending their use is that no 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, which is directly contrary to the spirit of the article RAILWAY, P. C., and reversing the position of the axes in the crossing marked 'f,' the reasons for this precaution will be readily understood. As the diagram now stands, the train 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 in Fig. 73) Put them in the other way, and 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 crossing so laid, the train must run on 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 ad-
justed; but the trifling inconvenience and delay occasioned by this manoeuvre is vastly 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 considerable speed. The last few months have produced two or three other arrangements to reverse the rolling of carriages into the main line so as to meet the traffic, upon the Brightow, Lewes, and Hastings railway, where, as there was at first a chance of injury by the wheels of the train treading on the running line, 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 at 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 ex-
posing 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, whenever they are brought into position they rise 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 clear of the rails 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 at stations to cross the main line for the express of a train, and to run 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 about an inch above the level of the main line, cutting the wheels of the train, when they are in the crossing section. By this arrangement the flanges of a carriage being pushed across the cross track, mount upon and roll over the rails of the main line, supporting the weight of the carriage until the wheels again meet the elevated rails of the cross
The necessity for breaking the continuity of the main rails by the interposition of turn-tables, tended to dim the attractiveness of the improved apparatus, and the smoothness of the transit upon the main line is undisturbed.

Some important improvements in turn-tables, tending to diminish the 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 unbroken; and others are distinguished by contrivances to ensure firmness and stability during the passage of trains over them. Dunn's patent turn-table, the details of which are illustrated in the 'Railway Chronicle' for 1846, p. 347, provides for this purpose in such a manner as to make the 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 line. Some ingenious features of this turn-table, besides the plan of its construction, which from 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, have 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 class, consists of a semaphore pillar, near the main lines, of the 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 slit 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 point, 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 each other, so that the line to which it refers is clear, so that trains may pass safely; when projected horizontally, that a train is a short distance ahead, that there is some obstruction on the line, or that the station is occupied. In other words, when the pillar is or when projected at an angle of 45° that, owing to a train being ahead, though at a safe distance, or owing to some circumstance, any approaching train should slacken its speed, and any other signal, to be described hereafter, may also be employed.

The day-time, signal lamps, with powerful parabolic reflectors, and capable, by the turning of handles at the bottom of each post, of being shifted so as to throw their light through either a white or coloured, a red, or a green glass, according to whether the signal required be to indicate safety, danger, or the necessity of caution, are also mounted near the top 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 two lines similar signals are used, but two 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, on or off; the signal, which is always displayed excepting while the train is on its post and actually holding the switches in the required position; and the caution signal, which is shown when the track to which it refers is proper. 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, inquires of the switchman, and by his directions, has the signal in such a position as to give light in what direction he wishes to proceed. In addition to these fixed signals, the mechanical details of which are fully illustrated in the 'Railway Chronicle' of 1846, pp. 423 and 615, are those of the now familiar apparatus, for night and day signals, costs about £300; 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 the red and white flags, according to the day or night; when trains are passing through, white lamps attached to the front of the engine, and red lamps behind the last carriage of the train, are used as signals with every train, their number and relative positions serving to distinguish the 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. When the train is about to leave the station, the head, 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 of its approach.

In cases where the faggy 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. Cooper 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 released by the driver, on the approach of the train, to 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, which may be regarded as the most effective of all the inventions of this kind. The improvements suggested by experience, have 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 class, consists of a semaphore pillar, near the main lines, of the 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 slit 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 point, 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 each other, so that the line to which it refers is clear, so that trains may pass safely; when projected horizontally, that a train is a short distance ahead, that there is some obstruction on the line, or that the station is occupied. In other words, when the pillar is or when projected at an angle of 45° that, owing to a train being ahead, though at a safe distance, or owing to some circumstance, any approaching train should slacken its speed, and any other signal, to be described hereafter, may also be employed. Such signals, with printed directions for their use, are deposited in every station, and are either fixed in such a manner as to be seen, or are adapted for use for the line on which they are adopted; and in case of an accident happening at night, several are fixed at intervals behind the point of obstruction, so as to give repeated warnings in an approaching train. When the line is clear they may be taken away and kept for future use. Such signals are used to stop all trains approaching a junction during a fog, until, by the mounting of the engine whistle and of a bell mounted for the purpose at the junction, the entire question of the plan of the signal-
largely and increasingly employed for passenger traffic, it becomes more and more necessary 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 wheel, the increased weight of the engine and the wear and tear of the springs and axles, in order to increase their elasticity, 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 supported by a single wheel, it is not according to our former rule of thumb to say that we 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 line, as there is some reason to believe has been the case in a single instance; and where no other method to increase their elasticity 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 when it is thrown upon one. The necessity for increased power, calling for the use of larger boilers and cylinders, is equal to the very general abandonment of that construction of engine 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 framing, and the power is conveyed to the wheels by external hand-rails and connections. 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 for working the machinery and connecting the parts under the boiler being much less than if 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 repair. The most of the new plant of the mechanical class, it is evident, may be examined and attended to while the engine is running; iron-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 order to increase the height; but more generally increased power of the generating steam is sought by lengthening rather than enlarging the diameter of the boiler. The occurrence, in December, 1848, of a fatal accident on the Norfolk railway, with an engine on the recently-constructed line of Mr. Robert Stephenson, led to much discussion on the merits of this kind of engine; General Pasley having given evidence against their safety, which called forth a reply from Mr. Stephenson, in which he denies the assertion that the additional length of the boiler was inefficient on account of the distance of the farther end from the fire-box, and states that 'even with the longest tube yet introduced in locomotive engines, the temperature at the opposite end of the tube has been found sufficient to melt lead, while it is upwards of 300 degrees above the temperature of the water in the boiler; a fact which indicates that locomotive-engine builders have not even yet attained the length desirable so far as the working of the engine is concerned, but more especially as regards 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 Pasley observed that in his long engines it is four or five feet longer than in those formerly used. The distance between the front 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 (in which, in his evidence before the Gauge Commissioners, Mr. Stephenson stated was, in his opinion, too long), is an increase of the 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 it had been extended to about 7 feet. Notwithstanding the great length of bearing, the fire-boxes of the longer engines referred to project beyond and overhang the hinder axle, so that the whole length of the bearings is about as much bearing upon the rails as in the original four-wheeled engines of the Birmingham line, with a bearing of only 6 feet 6 inches. Such large and powerful engines, by which it is anticipated that the present power of the engines obtained by that gauge 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, how-
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by the failure of which the vacuum was destroyed, and it became necessary again to transfer the traffic to the locomotive line. The London Bridge company (the new proprietors) are, however, considering the plan, and it is anticipated, a better valve will be fixed. 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 the communication with the Croydon and Epsom lines. While the Croydon and Epsom line has been constructed, and is expected to be ready for traffic about Christmas, 1846, the atmospheric apparatus has not been laid upon it, and it is not expected to be completed for some time. The engine-in-charge, Mr. William Cubitt, having recommended that course on the ground that the atmospheric system, as now at work and in progress towards completion, is "to tend to a rapid increase of the power of locomotion," and during its progress, by being compelled to deal at tally-shops by means of tickets, while payments are only made once a month or even two months, this, by a system of credit, exposing 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 want of cleanliness, discontent, disorder, drunkenness, and debauchery, on the line, the Directors of the Liverpool and Bury Railway 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 thousands of men employed in the construction of the railways which have already received the sanction of Parliament, it is deemed fit 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 injury of limbs, 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':—

1. Article 1382. Every act whatsoever of the man who occasioned a damage to another, obliges him by whose fault it happens to repair it.

2. Article 1383. Every one is responsible for the damage he has caused, not only by his act, but by his negligence or by his imprudence.

3. Article 1384. A man is responsible not only 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 has in his charge.

These provisions were not sufficiently understood by Mr. Chadwick, as they were understood to extend to companies, as well as to individuals; yet, by a law of July 15, 1843, on the general management of railways, a chapter was introduced to provide for the greater safety of railway passengers. The 22nd clause makes all owners or lessees of railroad responsible to individuals and the state, for injury caused by managers, directors, or any person 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 conduct 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. xxvi, a large proportion of those described as new lines are merely for constructing branches or extensions of lines previously authorised; while among the amendments of the Acts which authorised deviations or alterations of lines previously sanctioned, many instances occur of the aggregate number of miles of railway sanctioned in each year, which must be taken out of the general view, as the various circumstances combine to render perfect accuracy unattainable. The aggregate length also needs some reduction to account for the cases in which an act passed in one session was sanctioned in another; and further, it must be mentioned that the figures which follow, indicative of the aggregate number of miles of railway sanctioned in each year, must be taken as an approximation of the facts, as the various circumstances combine to render perfect accuracy unattainable.
The figures however would not require any serious deduction from the figures given—

Amendments. Total. Length.
1801-1840 135 164 299 (See P. C., p. 261.)
1841 2 17 19 144 miles
1842 17 29 46 79
1843 10 13 23 91
1844 33 15 48 797
1845 104 16 120 2883
1846 227 43 270 4790

516 286 802 8649

By adding the above computation of mileage to those given in the former account, it will be seen that, in round numbers, without any deduction for abandoned schemes, about 11,600 miles of railway have been sanctioned by 516 acts of parliament between 1801 and the close of the session of 1846, of which upwards of 10,000 miles have been designed for working by locomotive engines for passenger and general traffic. Of this latter class about 1100 miles were open down to the close of 1840, while the length opened since that time down to the close of 1846, as reported year by year in the 'Companion to the Almanac,' where accounts of the more important lines are given, is about 1550 miles, making a total of at least 2650 miles in operation, besides many hundred miles in progress and on the eve of completion. Of the vast addition of 4790 miles (without deductions for a few lines to be made for joint use, although the acts give powers for their construction to two distinct companies) sanctioned in 1846, it is probable that several will prove, according to changes in the financial state of the country, be abandoned for a time; but numerous other schemes, several of them of considerable importance, are announced to be preparing for the session of 1847. Great however is the number of non-railway lines passed in the session of 1846, the schemes sanctioned by them form but a small proportion of the projects which were in agitation about the close of 1845. In such a matter it is difficult to arrive at every line of correct estimate; but it was stated in a great tabular statement compiled by Mr. Spackman, and published in the 'Times' newspaper of November 17, 1845, that the capital then invested in completed railways amounted to 70,680,877l., that that already laid out, and yet remaining to be expended, upon lines then under construction, amounted to 67,359,355l.; and that the capital which would be required to carry out 920 schemes, of which the estimates were then before the public, would be about 568,938,000l.; in addition to which mention is made of 643 projected companies, of which, as they had not yet registered their prospectuses, the proposed capital could not be estimated. These figures sufficiently indicate the extent of the railway mania of 1845. In compiling the following tables of English, Scotch, and Irish railways, we have inserted none but those for which acts have been passed, either absolutely or provisionally, and which have been constructed without parliamentary powers, and to economise space, we have made no reference to the amount of capital which each company is empowered to raise. Though compiled with the most care, they cannot be regarded as absolutely correct, and are to be depended upon, especially as regards the acts of 1846, because the alterations and curtailments sometimes made in a railway bill after it has passed the Select Committee by whom its details are reported to the House of Commons, and a variety of other contingencies, render it more difficult than could be conceived by any who have not made the attempt, to obtain authentic and correct materials for such a compilation; but from the precautions which have been adopted the compiler believes his statements to present the fullest and most accurate record yet issued of the railways completed, in progress, or sanctioned by act of parliament, in each division of the United Kingdom. Without regarding the acts passed to the contrary, it may be presumed that all lines sanctioned prior to 1846, if not marked as opened, are in progress; and even of those of 1846 several have been already (November, 1846) commenced. As the capital is not specified in each particular case, it may be well to state that the aggregate share-capital authorised to be raised under acts of 1844 for the construction of about 797 miles of railway was 11,121,000l., indicating an average cost of about 14l. per mile, but, of course, this is not the exact cost, as some lines were estimated for completed works, and the balance of capital and the estimated cost of such new lines as were granted to existing companies without any fresh powers for raising more, shows an aggregate estimate of 48,844,907l., for the construction of about 2883 miles of railway, indicating an average cost of about 16l. 10s. per mile. It is remarkable, considering the rapid progress of railway construction, that the amount of money sanctioned for new lines in 1844 was only 19,500l., and that the capital raised under existing railways was in 1845, only 91,165,500l., which, for about 4790 miles of railway, amounts to rather over 19,000l. per mile. These computations are, like that for 1844, calculated on the usual practice of borrowing one-third in addition to the capital. It will be observed, in reference especially to the new lines of 1846, how many of the recent projects are either promoted by, or for the benefit of, companies already established, or united with, existing companies; although in this point we cannot pretend to perfect accuracy, as the connexion of new projects with existing undertakings is not always mentioned in the acts themselves; while in many cases, where it is of a peripheral character, circumstances may lead to its being broken off. In some cases also parliament has refused to ratify agreements for amalgamation which had been formally concluded by the companies involved, although it may have been with some of the agreements here indicated. It was stated in the 'Railway Chronicle' of June 6, 1846, that out of 210 bills of which a classified list is there given, only 61 were for new or independent companies, and lines proposed for the purpose of establishing existing corporations as branches or extensions of, or auxiliary to, their own lines; and several lines which were granted as independent undertakings have since that time been purchased by established companies.

RAILWAYS OF ENGLAND AND WALES.

Aberdare.—The Talyllyn Railway, near Ynys Meryrick, to Aberdare; length, with a branch, 86 m.; act passed 1845; opened August, 1846.

Aberdare, Rhondda, Merthyr Tydfil, and Eastern Junction.—From the Aberdare station of the Midland Railway, through Nottingham, to Spalding and Boston, with branches. Main line to Spalding and Boston, via Lincoln, Grantham, and Linculn; Lines which are to be used, 594; Boston extension 194; Sleaford branch 9 m.; canal branch 1 m.; Boston harbour branch 2 m.; total length 894; act passed 1845; sold to the Great Northern Railway Company. The act confers powers to purchase the Nottingham and Grantham canals.

Ashburton, Newton, and South Devon.—A broad gauge branch from the South Devon Railway, near Newton Abbott; length 102 m.; act passed 1846. The South Devon Company has an interest in this line.

Ashby and Hastings.—See Brighton, Lewes, and Hastings; Rye and Ashford Extension.

Ashton Branches.—See Manchester and Birmingham, and Sheffield, Manchester-Lyne, and Manchester.

Ashton, Stalybridge, and Liverpool Junction.—Sold to the Manchester and Leeds Railway Company, from whose line it branched in 1846. In 1853 this company amalgamated with the London and Stalybridge in September, 1846. An act of 1846 authorises a branch of 14 m. to join the Manchester and Birmingham line in the vicinity of Ashton. Also Stalybridge Extension.

Austen and Gloucestershire. [C. P. C., p. 202.]

Aylesbury [C. P. C., p. 292.].—Sold to the London and Birmingham, and North-Eastern and North-Western Railway Company, whose line it joins at Bletchley. Length 16 m.; act passed 1845; opened November, 1846.

Birkenhead, Chester, and Wirral Railway. [C. P. C., p. 319.]

Birkenhead, Lancashire, and Cheshire Junction.—From the Chester and Birkenhead Railway at Hooton to the Manchester and Liverpool Railway at Stockport. Length 844; with branches amounting to 7s. m.; total length 46 m.; act passed 1846. The Company has agreed to amalgamate with the Chester and Birkenhead Railway.

Birmingham, Bristol, and Thames Junction.—See West London, Birmingham and Derby Junction [C. P. C., p. 292.].—Final line of the West London Railway. Length 1943; merged in 1845. Also Birmingham and Gloucester [C. P. C., p. 292.].—Main line, from the London and Birmingham Railway, at Birmingham, to Gloucester, and from the Bristol and Gloucester Railway at Gloucester 1 m.; length 1943; merged in 1845. Amalgamated with the Bristol and Gloucester Railway, and the united lines leased in 1846 to the Great Western Railway Company. Also authorised extensions at both ends of the line, and a branch at Stuke Prior, amounting together to 1 m.; and in 1846 the
Midland Company obtained an act for a branch from King's Norton to Bates Owen, length 59 m.; Birmingham, Leamington, and Manchester.—From the Grand Junction Railway at Aston, near Birmingham, to the Trent Valley Railway at Lichfield; length 141 m.; act passed 1846. Sold to the London and North Western Railway Company, 1847.

Birmingham and Oxford Junction.—Main line from Birmingham to join the Oxford and Rugby and Oxford, Worcester, and Wolverhampton Railway at Syston; length 22 m.; act passed 1846. To continue the broad gauge into Oxford and to the surrounding districts, and thus to compete with the London and Birmingham Railway. Act of 1846, but this line and the Birmingham, Wolverhampton, and Dudley, with which it is intended to amalgamate, must be laid upon the broad gauge and thrown into the break of gauge line occasionally at Penny Compton, where the Birmingham and Oxford Junction line joins the Oxford and Rugby, would impair the value of this short opening route. It is intended in next session to seek again for power to adopt the broad gauge. The Stratford-on-Avon Canal is to be purchased by the Oxford, Worcester, and Wolverhampton Railway Company, and made over to this company.

This and the Birmingham, Wolverhampton, and Dudley lines are to be sold to the Great Western Railway Company.

Birmingham, Wolverhampton, and Dudley—Main line from Birmingham to join the Stratford-on-Avon Canal at Long Stratton, length 93 m.; act passed 1846. See Birmingham, Wolverhampton, and Dudley Railways Company. Removed to 15 m.; act passed 1846—removal to complete the London, Brighton, and South Coast Company.

Birmingham, Wolverhampton, and Dudley—Main line from Birmingham to join the Stratford-on-Avon Canal at Long Stratton, length 93 m.; act passed 1846. See Birmingham, Wolverhampton, and Dudley Railways Company. Removed to 15 m.; act passed 1846. Power to operate a short line, to be amalgamated with the Blackburn, Darwen, and Bolton.

Blackburn, Darwen, and Bolton.—From Blackburn to Bolton; mileage 18 m.; act passed 1846. A second act, passed in 1846, provides for a shorter junction with the London and Birmingham Railway Company. See also Blackburn, Darwen, and Bolton—North-Western Junction.

Bolton and Wigan.—Main line, 12 m.; branch to Bodolus, 11 m.; branch to Blackburn Bridge, about 1 m. Total, with branches and adjoins, 17 m. The Lancashire and Yorkshire Railway Company have taken powers to purchase or lease this line.

Bolton and Leigh [P. C. p. 262.—Purchased by the Liverpool and Manchester Railway Company.

Bolton and Preston [P. C. p. 262.—Completed 1843. Amalgamated with the North Union.

Bolton, Manchester, and Warrington.—From the Syston and Peterborough line of the Midland Railway, near Stamford, to the Wirbach Branch of the Lynn and Ely (or East Anglian) Railway; length 5 m.; act passed 1846. Sold to the Great Northern Railway Company.

Brandling Junction [P. C. p. 262.—Purchased by the Newcastile and Leeds Junction Railway Company.

Brandon and Peterborough Extensions.—See Eastern Counties.

Bricklayer's Arms Branch and Station.—From the London and Great Western Railway at Keynsham, to a station and branch for West of England traffic, and a means of escaping the high tolls of the London and Greenwhich line; but the Croydon Company's share was subse-

quenty sold to the South-Eastern, who, in November, 1846, dis-
continued the running of passenger-trains to the Bricklayer's Arms terminus, retaining only goods and cattle traffic.

Bridgend. [P. C. p. 262.]

Bridgewater Navigation and Railway.—A short line of 2 m. to connect the operations of the Bridgewater with the Bristol and Exeter Railway; act passed 1845.

Bridgewater and Tunstall Canal, Railway, and Harbour.—The act for this line, 262.1 m.; act passed 1846; for the Tunstall Branch Railway Company, 1846; for the Tunstall Canal Company to make a railway from Bridgewater to the Bristol Channel at or near Stolford, about 94 m., with three short branches, is act passed 1846. The Tunstall Branch Railway and Tunstall Canal are intended to form portions of a projected line to connect the Bristol and Exeter Railway Company, and the London and Brighton, now London, Brighton, and South Coast Railway Company. Acts were obtained in 1846 for branches of 14 m. to Littlehampton, and 44 m. to Swayning.


Brightling Branches.—See Hall and Selby, and York and North Midland.

Bristol and Chichester.—Extension of the Shoreham Branch of the London and Brighton Railway, by Worthing, and between Littlehampton and Arundel, to Chichester. Length, 20 m.; act passed 1844; opened June, 1845. Purchased by the London and Brighton, now London, Brighton, and South Coast Railway Company.
Barnley Branch.—See Manchester and Leeds.

Camberwell.—See London and Southampton Railway.

Cambridge and Huntingdon.—See Eastern Counties.

Cambridge and Oxford.—See Bury and Hitchin.

Cromer's Greatbook Steam Coal and Limes Co., and Laughter.

From Mal-y-Manch to RHysafyrth, in the county of Glamorgan; length, 5 m.; act passed 1846. Joins the Oystermouth tramway at RHysafyrth.

Catterick, Timperley, and Margate Branch.—See South-Eastern.

Catterall and Whitehall, [P. C., p. 292.]—Purchased by the South-Eastern Railway Company, and now worked wholly by locomotives.

Chard Canal.—An act of 1846 authorises the Chard Canal Company to relaid the portion of their canal between Creech Saint Michael and Ilminster; length, 82 m. See Beegroe and Tiverton Canal, Railways, and Harbours.

Clampitt, and Great Western Railway [P. C., p. 292.]—Opened to Cirencester, May, 1841; to Gloucester, May, 1845. The remainder of the line to Cirencester forms part of the Bristol and Exeter Railway. Purchased by the Great Western Railway Company.

Chester and Birkenhead (P. C., p. 202.)—An act of 1845 authorises the company to open, from Birkenhead to Bebington. See Birkenhead, Lancashire, and Cheshire Junction.

Chester and Crewe (P. C., p. 262.)—Lengh, about 844 m. The original act, passed in 1844, differed the portion near the Menai Strait, which it was then proposed to cross by the existing suspension-bridge at 1845. In 1845, the act of the company, providing for a new bridge, which is to be made in the form of a wrought-iron tube or hollow beam, of about 460 feet span, so elevated that vessels may sail under it. See North Wales, and Shropshire Union.

Chester and Wolverhampton.—See Shropshire Union.

Clarence.—See North Staffordshire.

Clay-Cross and Newcast.—See Midland.

Cornwall Railway.—The Western, and Yarmouth and Norwich lines take its line. In 1845, the Eastern Counties Company made matters of amalgamation with the Northern and Eastern Counties, and became a corporation. of their finished line of about 29 miles from the Eastern Counties line at Stratford to Bishop's Stortford, with the Eastern Counties line on the London and Ware branch, and of the unfinished extension of about 10 m. from Bishop's Stortford to Newport. In 1846 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 29 m. under an act of 1846, in order to pass through with Grimsby, Humber and Hull Canal. See the original line completed in 1846. Another act of the same session authorised a line of 17 m. from Cambridge to Huntingdon. In 1846 the Eastern Counties Company obtained an act for a railway from London and Stratford stations; making a line from Epping, 10 m. long, and two branches, amounting altogether to little more than 12 m. long. See Eastern Counties.

Cromford and High Peak. [P. C., p. 202.]

Croydon and Epsom.—Length, 8 m.; act passed 1844; sold to the London and Southampton Railway Company. Projected as an atmospheric railway, but is to be worked for the present by locomotives. See Direct London and Portsmouth....

Cromer's Greatbook Steam Coal and Limes Co., and Laughter. [P. C., p. 262.]—Debdale and Stock.—From Mellor, in the parish of Minster, to Black Rock, in the parish of St. Michael, St. Minver Lowlands, Cornwall; length, 16 m.; act passed 1844. To be worked by horses, though some passenger-traffic is expected.

Debdoff Pier Junction [P. C., p. 262.]—Abandoned.

Devon, Bristol, and Dover Junction.—See Reading, Guildford, and Reigate.

Direct London and Portsmouth.—From the Croydon and Epsom Railway at Epsom to Portsmouth; length 604 m.; act passed 1844. This line lies near the line of the London, Brighton and South Coast Railway Company, as an atmospheric railway; but it now (November, 1845) appears probable that locomotive power may be adopted. The new line will be to the London, Brighton and South Coast, and London and South-Western Railway Companies jointly. See Reading, Guildford, and Reigate.

Ealingna, Greatfair. [P. C., p. 262.]—Amalgamated in 1846 with the Llwyth Valley Railway; and may probably be converted into a locomotive line.

Denzel and London and Birmingham.—From the London and Birmingham Railway near Leighton Buzzard, length 32 m., act passed 1845. To be leased or sold to the London and North Western Railway Company.

Dorking Junction [P. C., p. 262.]—Length, from the Selsham Railway to the Staneh and Tye Railway (both of which were made without acts of parliament), nearly 5 m. Purchased by the Newcastle and Darlington Junction Company. Purchased by the Newcastle and Darlington Junction Railway Company, and to be adopted by the Company.

East and West India Docks and Birmingham Junction.—From the East and West India Docks to the London and Birmingham railway at Camden Town; length, 8 m.; act passed 1846. Promoted to be a branch of the London and Birmingham Railway Company.

East and West Yorkshire Junction.—From Knaresborough to the Great North of England Railway about 14 m. from York; length, barely 14 m.; act passed 1846.

East Anglian.—Under this title it is proposed to amalgamate the Lynn and Ely, Lynn and Dereham, and Ely and Huntingdon Companies and to lease them to the Eastern Counties Railway Company.

East Lancashire (originally Manchester, Bury, and Rosendale and Accrington.)...[P. C., p. 262.]—Opened from London to Colebeater, 514 m.; in March, 1843, and the remainder of the original parliamentary line abandoned; the Eastern Union; Ipswich, Bury, and Accrington Union and the North and South Railway.

East London.—See London and Southampton Railway.

East Midland Counties and St. Andrew's.—[P. C., p. 262.]—Opened from London to Colebeater, 514 m.; in March, 1843, and the remainder of the original parliamentary line abandoned; the Eastern Union; Ipswich, Bury, and Accrington Union and the North and South Railway.

East Anglian.—[P. C., p. 262.]—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.—[P. C., p. 262.]—From Colebeater to Ipswich; length, 17 m.; act passed 1844; opened June, 1845; from Colebeater the line was made by the Eastern Counties, but the land being theirs; but this portion has been sold to the Eastern Counties Company. Sold to the Eastern Counties Company.

Ely and Huntingdon.—Length, under the original act of 1845, 26 m.; but its line as afterwards shortened by an act of November, 1845, the Eastern Counties line about 1 m. from Ely. See East Anglian.

Epsom and Edenbridge.—The Eastern Counties Company obtained an act for a railway from Epsom to Edenbridge, with the line thence to East Grinstead, and to South Coast Railway Company. See Edenbridge and South Coast, and London and South-Western Railway Companies jointly. See Reading, Guildford, and Reigate.

Epping.—[P. C., p. 262.]—Amalgamated in 1846 with the Llwyth Valley Railway; and may probably be converted into a locomotive line.

Ernesoth Valley.—[P. C., p. 262.]—From the Midlothian Railway at Sawley to the Mansfield and Phixton Railway; length, 119 m.; act passed 1845; sold to the London and North Western Railway Company. For extensions and branches see Midlothian.
to the Bristol and Exeter. To open December, 1846. An act for the extension at the Grey Inn and Bagrrudge Wells roads, north of the Middlesex House of Correction. The proprietary is formed by amalgamating with the London and York, and the rival direct Northern Railway Company. See

Foster and Emmouth.—Length, with a very short branch at Topsham, 104 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 Bull Hill).—[P. C. p. 263.]

Furness.—Original line, under an act of 1844, intended to connect iron-mines near Dalton Ladle, and slate-quarries at Kirkby- Ireth, with the coast at Barrow and Rampside; length, 158 m. Opened in June, 1846, and passenger-traffic worked in connexion with steamers from Fleet harbour to Fleet Creek. As act of 1846 authorised a branch from Fleeton to Broughton, only 4 m. from Dalton to Ullswater, and branches to the Whirrige and Butts iron-mines, making a total of 9 m.

Gosport and Chichester.—[P. C. p. 263.]

Gosport and Dean Forest.—From Gosport to the Monmouth and Hereford Railway, and to the South Wales Railway at Aylestone; length, nearly 6 m.; act passed 1846. To be sold to the Great Western Railway Company.

Great Western [P. C. p. 263.—] Completed June, 1841. The company has purchased the Burts and Hunts, the Cheltenham and Great Western, the Montmorency and Hereford, and the Oxford and Rugby lines. See the Burts and Hunt; and possess the Oxford Branch, which see. See also, for further connections, Birmingham and Oxford Junction; Birmingham, Wolverhampton, and Dudley; Bristol, the Gloucester and Hereford, and Rotherham; Great Western and Uxbridge; Great Western and Wycombe; Oxford, Winchester, and Wokingham; Fort- burg; South Devon; South Wales; West Cornwall; West Lon- don; and Wilts, Somerset, and Weymouth.

Great Western and Oxford.—Johns the Great Western line at West Drayton, where over 24 m.; act passed 1846.

Great Western and Wycombe.—From the Great Western line at Maidenhead to High Wycombe; length, over 94 m.; act passed 1846. To be sold to the Great Western Railway Company.

Greenwich and Gravesend.—See South-Eastern.

Guildford Extension, Portsmouth, and Fareham.—Projected as the Guildford, Chichester, Portsmouth, and Fareham Railway; the original line, under an act of 1846, only to the London and Portsmouth, the act passed in 1846, sanctions only a line of about 4 m. from Guildford to the Direct London and Portsmouth at Fareham, to be sold to the Great Western Railway Company. The power to make these has been sold to the London and South-Western Railway Company.

Guildford Junction Railway.—The London and South-Western Railway; length 6 m.; act passed 1844; opened May, 1845. Sold to the London and South-Western Railway Company.

Harrodsfield, and Sheffield—See North Staffordshire.


Hay [P. C. p. 263.]

Heathfield and looking to the North of London and South- Western Railway Company.

Huddersfield and Manchester Railway and Canal.—A railway from the Sheffield, Ashton-under-Lyne, and Manchester to Stalybridge to the Manchester and Leeds line at Kirkcudbright, 214 m.; with a branch of 1 m. to Delph; act passed 1845. The Company to purchase the Huddersfield and Sir John Bramley’s canals. Acts of 1846 authorise a deviation at Huddersfield; a branch of 14 m. from Cooper Bridge; and a branch of 4 m. to the Manchester, Ashton-under-Lyne, and Manchester and Sheffield Railway Company at Oldham. The whole of the line passing from York to Darlington, 440 m. March, 1841; and the remainder of the parliamentary line abandoned, the Newcastle and Darlington Junction has been purchased by the Newcastle and Darlington Junction Company, the name of which, under an act of 1846, which sanctions the pur- chase, is established in the Stock Exchange. Under an act of 1845, a branch of 9 m. has been formed from a few miles south of Darlington to Richmond, which was opened in September, 1846; and under acts of 1846 the York and New- castle Railway Company have power to make branches to Bedale, 7 m.; to Boroughbridge, 62 m.; and from Thirsk to Malton, 204 m.; with subsidiary branches of 5 m. to Helmsley, 6 m. to New Malton, and 23 m. to Selby.

Great North of England, Clarence, and Hartlepool Junction [P. C. p. 263.—] Acts of 1843 and 1845 authorised new branches of 20 m. from the Great Northern Railway Company to the Seaboard, and sold to the Hartlepool Dock and Railway Company, and has merged with it in the York and Newcastle. Opened October, 1846, in connexion with a re-opening of the Hartlepool line as a branch of the York and Newcastle.

Great North of England and Richmond.—See Great North of England and Richmond.

Great Northern (originally London and York).—Main line from King’s Cross, London, by Hitchin, Biggleswade, Huntington, Peterborough, Grantham, Lincoln, Newark, Grantham, Don- caster, and Selby, to the Great North of England Railway at or near the York station, nearly 186 m.; loop or diverging line from near Grantham, to Lincoln, Grantham, Louth, and Grimsby, 66 m.; branch to Lodge, near 8 m.; minor branches and junctions, about 64 m.; total, 274 m. The act of 1845, the subject of a separate act, is a branch of the Great Northern, and several others are projected. The company also proposes to...
Launceston and Victoria [P. C., p. 263].—Abandoned.

Leeds and Bradford.—Original line, under an act of 1844, from Launceston, along the valley of the Aire, and by Shipley, to Bradford, 138 m.; with a branch of 14 m. to the North Midland Railway. In July, 1846, an act of 1845 authorises an extension from Shipley to Colne, with a branch to Haw-
tworth, together 393 m.; and acts of 1846 provide for an alteration of the line to join 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, a branch is now projected to Dewsbury, and thence to Huddersfield, being a main line of 16 m. with branches amounting to 4 m. The line from Hudders-
fied, however, is only to be made if the Hudders-
field and Manchester Company fall to complete their act passed 1845. A second act of 1846 provides for deviations at Dew-
and mineral traffic; the Holden Clough branch of 5 m. to the Birstall branch, nearly 3 m. To be leased to the London and North-Western Railway Company.

Leeds and Thirsk.—Main line 394 m.; branches to Knares-
borough Junction Railway at Whalley, a branch of over 6 m. to Westmor-
den; and an amalgamation with the Manchester and Leeds. Acts of 1846. The connection of this line by the Midland Railway Company, and confer on the purchasers power to alter 14 m. of the line, and to make new branches to Leicester, 32 m.; to Burton-
upon-Trent, 27 m., and on the northwest side of the city, nearly 23 m. Liskeard and Caradon.—Length, main line, 64 m.; branch to the Cheesefaring, 24 m.; act passed 1845; partly opened 1844. For mineral traffic. Worked by gravity and horse-power. See Cornwall.

Leicester and Syston.—[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 make new branches to Leicester, 32 m.; to Burton-
upon-Trent, 27 m., and on the northwest side of the city, nearly 23 m. Liskeard and Caradon.—Length, main line, 64 m.; branch to the Cheesefaring, 24 m.; act passed 1845; partly opened 1844. For mineral traffic. Worked by gravity and horse-power. See Cornwall.

Liverpool and Bury.—Original line, under an act of 1845, from Liverpool to Wigan, Bolton, and Bury, 24 m. Acts of 1846 authorise an extension of 6 m. to Tythe Barn Street, Liverpool; a branch of nearly 1 m. from the New Springs branch to the North Kensington branch; and an amalgamation with the Manchester and Leeds. Acts of 1846. The junction line referred to in the above act, 14 m., was completed in March, 1844. An act of 1845 authorises a new entrance into Liverpool, and a branch to join the Manchester, Bury, and Rossendale line at Gorton; 7 m.; act passed 1846. Another 73 m. of the same session ratified the amalgamation of the Liverpool and Manchester, with its connections, the Bolton and Leigh and Ken-
on; and the St. Helens line, with which it is now merged in the London and North-Western.

Liverpool, Manchester, and Newcastle-upon-Tyne Junction.—Main line, from the Leeds and Bradford Railway at Elslack, to the Richmond branch of the Great North of England Railway at Serton, 474 m.; branch to Hawes, over 9 m.; act passed 1846. This undertaking comprises the main line of the Lancashire and North Yorkshire Railway; and, in the Hawes branch, a portion of that projected by the Liverpool, Manchester, and Newcastle upon-
Tyne Junction Railway at Whalley, a branch having been cancelled while before parliament. The Hawes branch, being identical with part of the Yorkshire and Glasgow Union projected line, is not to be made if that line be, as intended, constructed by a new Northern Union Counties Railway Company, which see. The capital is partly subscribed by the Manchester and Leeds Railway Company.

London, Ormskirk, and Preston.—Main line, from the Liverpool and Bury Railway at Walton-on-the-Hill to the North Union Railway at Penwortham, 231 m.; branch to the Blackburn and Freckleton Railway, 6 m., including the Lydiate-Gate branch of 3 m.; branch to near the junction of Walton Street and Regent Road, Liverpool, nearly 1 m.; total 29 m. Amalgamated with the South Eastern Railway Company.

Lowelly [P. C., p. 264].—The total length of this line and its branches, according to evidence before the Gauge Commissioners (1843), was 9 m.; act passed 1846. As it joins the South Wales Railway, this line is laid on the broad gauge. The company has amalgamated with the Duffryn-Llwydiarth and Newport-Cr.cf Railway Company.

Manchester, Blackpool, and Lynn.—[P. C., p. 264].—The act of 1843 this company has made a branch of 4'7 m. from Bithorn, by Northampton, to Peterborough, which was opened in June, 1845. It also passed the Aysgirth and Crosby Valley, and the Warwick and Leamington Union Railways; and, under an act of 1845, has amalgamated with the Grand Junction and Manchester and Birmingham Railway Companies, incorporating the numerous lines and connections of the latter under the comprehensive title of the London and North-Western Railway, which see. Other acts of 1846 confirm certain arrangements with the Bir-

London and Blackwall (formerly Commercial) [P. C., p. 264].—Extension line of 5 m. to near Fenchurch Street opened 1845-August. In 1846 gives a new line from Stepney to Fenchurch Street, to accommodate the traffic expected from the Eastern Counties Railway by the London and Blackwall Extension Company, which see, worked by the London and Blackwall Company. The East and West India Docks and Bir-

London and Brighton [P. C., p. 264].—The main line, of 419 m., from near Croydon to Brighton, was completed in Septem-
ber, 1841; the shortest branch, of 54 m., in May, 1846. The other branches mentioned in P. C. were abandoned, but are replaced by branches granted in 1846 in connection with the Brigh-
ton, Lewes, and Hastings. The line between Croydon and Reigate or Redhill, is worked by the Brighton and South-Eastern Companies jointly, one-half of its cost having been repaid to the former before 1849. The line maintains the southern half of that portion of the line. The Lon-

London and North-Western.—[P. C., p. 263].—The main line, from Liverpool to London, 370 m.; branch to meet the Croy-
don, Brighton, and South Coast Railway Company, which 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, con-

London and Croydon [P. C., p. 264].—The Company have purchased the Croydon and Epsom Railway (which see), and are (1846) laying down in connection with it an atmos-

tropic line alongside of their original works, under the au-
tority of an act of 1845. Acts of 1846 authorise the con-


London and Greenwich [P. C., p. 264].—The line was widened from London Bridge to Croydon, and the London, Greenwich and New Year's Green Company, the new portion being brought into use, 1 May, 1842. Since that time a lease for 99 years has been granted to the South-Eastern Railway Company, who obtained powers in 1845 for a further widening, and in 1846 for a line from the
Greenwich Railway to Gravesend. The London Bridge station was formed at the expense of the London, Brighton, and Croydon, and South-Eastern Railway Companies.

**London and North-Western.—** Under this new title, by an act of the 16th and 17th of Geo. IV., cap. 105, dated 27th of July, 1825, the London and Birmingham Railway Companies, with their respective connections, are amalgamated. The aggregate share-capital of the united company, according to the act, was 17,242,301l.; and the amount of loans, 5,747,000l.; making a grand total of 22,989,301l.; which, however, will be greatly extended when the capital for the various new lines was granted in 1846 to the North-Western Railway Company. As well as these numerous additional purchases and amalgamations proposed shall be carried into effect. Besides the lines referred to as connections, there are the several companies now united under this title, and the London and North-Western Company possess shares, or have some interest in the Chester and Holyhead, Lancaster and Carlisle, and Caledonian Companies; and Leeds, Dewsbury, and Manchester.

**London and Portsmouth.—** See Direct London and Portsmouth.

**London and South-Western (formerly London and Southampton)** [P. C. p. 304.—Act of 1844 authorises a branch of 3½ m. from Bishoptoke to Salisbury, which is (November, 1840) nearly completed, and a short extension from the Nine Elms station, which has not been carried into effect. An act of 1845 authorises an extension of about 9 m. from Nine Elms to a point near Watford; and an extension of another 9½ m. from the junction with the Midland Railway at Salisbury, with a subsidiary branch of 1½ m. to join the Bishoptoke and Salisbury branch; a branch of 6½ m. from the junction with the South Western Railway at Salisbury, from the Guildford Junction line, near Guildford, to Farnham and Alton; and a branch of 1½ m. to Hampton Court bridge. The Gypsum Branch, opened in February, 1842, is incorporated with this undertaking. See also Direct London and Portsmouth, Guildford Junction, Guildford Extension, Farnham, and Portsomth; Richmond; and Southampton and Dorchester.

**Lovelace Railway and Harrow.—** From Lovelace to the Yarmouth and Norwich Railway at Reeds Hall; length 11 m.; act of 1841; passed 1843; part opened October, 1846. Agreement to amalgamate with the London and South-Western Company, under the name of the Great Eastern Railway, passed 1844; sold to the London and South-Western Railway Company.

**Lynn and Egg Railway.—** Main line, from the Lynn and Dereham Railway at Lynn, to the Eastern Counties Railway at Egg, 26½ m.; branch from Reedham to the Great Eastern Railway, about 2½ m.; length 29 m.; act passed 1842; open to traffic 1845.

**Lynn and Egg Railway.—** Main line, from the Lynn and Dereham Railway at Lynn, to the Eastern Counties Railway at Egg, 26½ m.; branch from Reedham to the Great Eastern Railway, about 2½ m.; length 29 m.; act passed 1842; open to traffic 1845.

**Lynn and Egg Railway.—** Main line, from the Lynn and Dereham Railway at Lynn, to the Eastern Counties Railway at Egg, 26½ m.; branch from Reedham to the Great Eastern Railway, about 2½ m.; length 29 m.; act passed 1842; open to traffic 1845.

**Lynn and Egg Railway.—** Main line, from the Lynn and Dereham Railway at Lynn, to the Eastern Counties Railway at Egg, 26½ m.; branch from Reedham to the Great Eastern Railway, about 2½ m.; length 29 m.; act passed 1842; open to traffic 1845.

**Lynn and Egg Railway.—** Main line, from the Lynn and Dereham Railway at Lynn, to the Eastern Counties Railway at Egg, 26½ m.; branch from Reedham to the Great Eastern Railway, about 2½ m.; length 29 m.; act passed 1842; open to traffic 1845.

**Lynn and Egg Railway.—** Main line, from the Lynn and Dereham Railway at Lynn, to the Eastern Counties Railway at Egg, 26½ m.; branch from Reedham to the Great Eastern Railway, about 2½ m.; length 29 m.; act passed 1842; open to traffic 1845.
The length to branch, m.

An act of 1846 authorises an extension of 224 m. from the Deringham branch (see Act) for leasing purposes for nearly 61 m. to Blakeney, total 592 m.; and another sancctions the purchase or lease of the Lowestoft Railway, Harbour, and Navigation Company. The Newcastle-upon-Tyne–Darlington Junction Railway, and is to be continued by agreement for joint use. It was passed 1846. This undertaking is formed by the consolidates the York and Carlisle and Yorkshire and Glasgow projected.
Ruis, adopting the course of the latter from Thirk to Clifton and a portion of the Amendment to Teyho. 

Northern Union.—See Newcastle and Darlington Junction. 

Norwich and Brandon.—By the original act of 1844 this was to be a main line of 38 m., with a branch, 3 m., to Thetford; but under an act of 1845 the main line was diverted to pass through Thetford, making the length about 36 m. Opened July, 1846. 

Amalgamated with the Yarmouth and Great Yarmouth Railway, which see. 

The act of 1845 allows a branch of 1 m. from Wymondham to East Dereham. 

Norwich and the Yarmouth Railway. 

Oxford and Bletchley Junction.—See Buckinghamshire. 

Oxford Branch.—From the Great Western Railway at Didcot to Oxford, opened June, 1844. Made by the Great Western Railway Company. 

Oxford and Rugby.—From the Oxford branch of the Great Western Railway at Oxford to the London and 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 Wolverhampton.—The original act passed 1843 for a main line of 259 m. in extension of the Oxford branch of the Great Western Railway, with the Worcester branch, 13 m.; the Stock branch, 4 m.; the Stonebridge branch, 1 m.; and the Compton branch, 3 m. Act sanctioned at 7 October, 1845; and in 1846 they obtained an act for extending the line by 10 4 m. An act of 1846 provides for some alterations in the line, and a branch of 8 m. to Stratford-on-Avon, one of 4 6 m. to Wilmcote, and a connection of 4 m. at Dreish, making together 19 m. of new line. The line is being constructed for the broad gauge, and under a guarantee from the Great Western Railway the options are subject to the condition of laying additional rails where the connection with narrow-gauge lines may render it necessary in order to avoid a break of gauge. (See also the gauge controversy, p. 665.) The company have leased the Stratford and Moreton Railway; and the act of 1846 gives power to purchase the Stratford-on-Avon and Stonebridge branches, the portion of which line is to be leased to the Birmingham and Oxford Junction Railway Company. 

Oystermouth. [P. C. P. 264.] See South Devon. 

Portishead 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 Stockbridge and Tyne Railway, running for about 34 m. from South Shields, through the northern part of the county of Durham, to Stanhope, which was worked, at least partially, by locomotive engines, and used principally for coal traffic. It proved an unsuccessful speculation; and in 1832 a new company was incorporated by act of parliament for working a portion of the line, the old company being dissolved. In 1834, 1835, 1836, and 1837 acts were obtained for extending the Portishead and South Shields Railway Company, obtained an act for widening a part of their line, and making a new branch of 4 m. to the Bramley Ghyll line. The undertaking was completed by the whole undertaking has been consolidated with the Newcastle and Darlington Junction, now the York and Newcastle Junction Railway Company. 

Portland. [P. C. P. 264.] 

Portbury Pier and Railway.—The act, passed in 1846, is for making a pier at Portbury, and a railway of nearly 6 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. 

Potteries Line.—See North Staffordshire. 

Preston and Wyresdale. [P. C. P. 265.] An act of 1845 authorizes branches to Blackburn, 32 m.; to Lytham, about 4 m.; and to Lytham Dock, under 2 m. These were opened in April, 1846. An act of 1846 sanctions the amalgamation of the Preston and Wyre Railway, Harbour, and Dock Company with the Manchester and Leeds Railway Company. 

Reading, Guildford, and Reigate.—Length, main line 454 m., and two branches at Yarnham, where the line joins the London, Brighton, and South Coast Railway, and the line of 43 m., which this line, which is part of the projected Devizes, Bristol, and Dover Junction Railway, is to be leased to the South-Eastern Railway Company. 

Regent, Guildford, and Reigate. —Length, main line 454 m., and two branches at Yarnham, where the line joins the London, Brighton, and South Coast Railway, and the line of 43 m., which this line, which is part of the projected Devizes, Bristol, and Dover Junction Railway, is to be leased to the South-Eastern Railway Company. 

Regent, Guildford, and Reigate. —Length, main line 454 m., and two branches at Yarnham, where the line joins the London, Brighton, and South Coast Railway, and the line of 43 m., which this line, which is part of the projected Devizes, Bristol, and Dover Junction Railway, is to be leased to the South-Eastern Railway Company. 

Retail and Wigan.—See North Union. 

Preston and Wyre. [P. C. P. 265.] An act of 1845 authorizes branches to Blackburn, 32 m.; to Lytham, about 4 m.; and to Lytham Dock, under 2 m. These were opened in April, 1846. An act of 1846 sanctions the amalgamation of the Preston and Wyre Railway, Harbour, and Dock Company with the Manchester and Leeds Railway Company. 

Reading, Guildford, and Reigate. —Length, main line 454 m., and two branches at Yarnham, where the line joins the London, Brighton, and South Coast Railway, and the line of 43 m., which this line, which is part of the projected Devizes, Bristol, and Dover Junction Railway, is to be leased to the South-Eastern Railway Company. 

Rotherham, Barnsley, Wakefield, Huddersfield, and Goole.—Main line, rather over 21 m.; Silkstone branch, nearly 2 m.; Dodworth branch, 3 m.; total 26 m.; act passed 1846. The portion north of Barnsley is to be leased to the Manchester and Leeds Railway Company, and the remainder to the South Yorkshire Coal, Railway, and Canal Company, who, having failed to obtain their act in 1846, are applying for leave to sanction this arrangement in 1847. 

Sheldon Tunnel.—See Wear Valley. 

Shglesby and Cole.—See Leeds and Bradford. 

Shrewsbury and Birmingham.—The act obtained by the Shrewsbury and Birmingham Railway Company in 1846, was for a main line of 291 m. from Shrewsbury to Birmingham, with a branch or fork of 7 m. to the Abbey Foregate, Shrewsbury, and
a branch of 4 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—Shrewsbury, Wolverhampton, and South Staffordshire Junction Railway Company (with which this company is amalgamated or united for the purpose of making the line granted to the formation of a railway between Shrewsbury and Wolverhampton, and a large part of the line granted to the other company; as between Tetshall and Wolverhampton), the Birmingham, Wolverhampton, and South Staffordshire Junction Railway 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 communication connected with the London and North-Western Railway.

Shrewsbury, Wrexham, and Chester Junction—From Shrewsbury to the North Wales Mineral Railway at Cefn Mawr, with branch to Oswestry; length 233 m.; act passed 1845. Acts of 1846 sanction an extension of the main line from Shrewsbury, and deviations at Shrewsbury and other places amounting to 8½ m.; branches of 6 m. to Crich Heath, and of nearly 7 m. to We; and the amalgamation of the whole undertaking with the Act which sanctioned the Great Western Railway, which partly overlaps the Shrewsbury and Chester Railway.

Shrewsbury and Stafford—See Shropshire Union Railways and Canal. Length, main line from Shrewsbury to Wolverhampton, rather over 291 m.; branch at Shrewsbury, nearly 7 m.; act passed 1846. In 1861 an act was passed for the amalgamation of the Shrewsbury and Birmingham, a considerable portion of this line will be abandoned, the two companies uniting to execute certain portions of the works.

Shropshire Union Railways and Canal.—Three acts were obtained in 1846 by a company with the above title, authorising, respectively, the formation of a railway of nearly 46 m., from the Chester and Crewe branch of the Great Western Railway, at Calveley, to Wolverhampton, called the Chester and Wolverhampton Railway, to purchase the line of the Ellesmere Canal, 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 Montgomery, to Shrewsbury; 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 105 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 Junction Company should obtain their act, which both did, although, as explained under Shrewsbury and Birmingham, only part of the scheme of each is to be carried into execution. Arrangements have been made by the two undertakings for the leasing of the whole of the Shrewsbury and Chester Junction; and the amalgamation of the company with the London and North-Western Railway Company.

Shrewsbury and Chester Junction Railway Company is an interesting branch of the Shropshire Union System. [F.C., p. 265.]

South Devon—From the Bristol and Exeter Railway at Exeter to Plymouth; length, about 51½ m., exclusive of a branch of about ½ 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 ft. Intended for working by atmospheric power; but 15 m., from Exeter to Tegitmachen, opened in May, 1846, with locomotive engines. An act of 1846 sanctions a branch of 5 m. from Aller, near Newton, to Torquay; a deviation of the main line near Newton; and several alterations in connection with the towns of Plymouth and Torquay. The power company proposes to subdivide this line under the Great Western, Bristol and Exeter, and Bristol and Gloucester Railway Companies, which are empowered to lease the company's line. The Devon Company also proposes an interesting branch from the Ashburton, Newton, and South Devon and the Cornish lines.

South-Eastern—[F. C., p. 265.].—The main line, which was extended to the Dover end in 1840, opened throughout in February, 1844. A branch of 10 m. from Paddock Wood to Maidstone, made under an act of 1843, was opened in 1844. In 1844 the company obtained an act for a branch of 4 m. to Folkestone Harbour (which they had purchased), which has since been completed; and for a branch of 3½ m. to Canterbury, which was completed in 1846. In September, 1845, they opened the greater part of the Tumbling Wells branch, from near Mumford, which was made in anticipation of an act of parliamant and completed in 1846. In 1845 they obtained acts to sanction the last-mentioned branch; to enable them to alter and extend the Canterbury, Ramsgate, and Margate branch, and for the formation of two lines from Ramsgate to the Channel, in order to enable them to purchase the Canterbury and Whitstable Railway; and to widen the London and Greenwich Railway, which they propose to extend to Ramsgate; and they have also obtained acts for enlarging the station at Ashford, as a central locomotive depot; for making a railway of 2½ m. from the London and Greenwich Railway, which they propose to extend to Ramsgate, and for the formation of a branch to Ramsgate Park; for a line of 25½ m. from their Tumburidge Wells branch to join the Rye and Ashford extension of the Brighton, Lewes, and Hastings Railway near Hastings, with a running line of 6 m. towards Rye; for a branch of 1½ m. from Rye to Rye Harbour; and for authorising the purchase of the Gravesham, Dartford, and Gravesend Railway, about 15 m. from Dartford Junction.—The Brighton, Lewes, and Hastings Railway, which is amalagamed, as the South Staffordshire Railway, a branch of 8½ m. to Darenth; a branch of 32½ m. to Mote End; a branch of 29 m. to Chilham; a branch of 24½ m. to Willingham, and a branch of 12½ m.; act passed 1846. See Birmingham, Wolverhampton, and Dudley.

South-Western Railway Company.—Proposed as a broad-gauge line in connection with the Great Western Railway, to commence by a junction with the Cheltenham and Great Western Union Railway at Stourbridge; or, were objections to the proposals to the Severn Railway, an act of 1846 was to a main line of 160 m. from Chesham to Flasbury and Pembroke Dock, with a branch of 27 m. to Monmouth. An act of 1847 provides for an extension of 12 m. from Chesham to join the Gloucester and Forest of Dean Railway at Haflow Farm; a branch of rather over 14 m. to Swansea, and a branch of 6½ m. to Haverfordwest, making in the whole 185 m. of new line; and also sanctions several deviations, amounting to 233 m., on the original main line and branch; but owing to objections to the proposed crossing of the Severn, it seems to the efforts to obtain a direct connection with the Great Western line by means of a bridge or tunnel at Hock Crib. The undertaking is leased to the Great Western Railway Company, with provision for a future amalgamation. See also Bristol and South Wales Junction Railway—Lagan Valley; Treby, Saundersfoot, and South Wales; and Vale of Neath.

South-Western—See London and South-Western.

South Yorkshire—See Sheffield, Rotherham, Barnsley, Wakefield, Huddersfield, and Barnsley.

Southampton and Dorchester.—Length, 60 m.; branch to Poole, 2½ m.; act passed 1845. Gauge, 4 ft. 8½ in.; to be leased to the London and North-Western Railway Company. [F.C., p. 265.]


Stratford-upon-Avon—Branch of the Great Northern Railway in the parish of Ufford, Northamptonshire, to the loop-line of the same railway in the parish of Crowthorne, Berkshire; length, 2½ m.; act passed 1846. Sold to the Great Northern (late London and York) Railway Company.

Stoke-on-Trent—See Stafford and North Stafford.

Stockton and Darlington.—The line, 8½ m. long, from the Clarence Railway about 4 m. north-east of Stockton to Hartlepool, was made without an act of parliament, and opened in 1840; but in 1843 the company obtained an act of incorporation.


Stratford and Tamworth Junction.—See Eastern Counties and Tamworth Railways.


Sussex—See Beachy Head's Steam Coal, etc. Syon and Peterborough.—See Midland.

Taff Vale—[F. C., p. 265.].—Main line opened throughout, April 1846. In 1844 the company obtained an act for a branch of 3½ m. to Penarth Harbour (which they had purchased), which has since been completed; and for a branch of 3½ m. to Neath, which was completed in 1846. In September, 1845, they opened the greater part of the Tumble Wells branch, from near Mumford, which was made in anticipation of an act of parliamant and completed in 1846. In 1845 they obtained acts to sanction the last-mentioned branch; to enable them to alter and extend the Canterbury, Ramsgate, and Margate branch, and for the formation of two lines from Ramsgate to the Channel, in order to enable them to purchase the Canterbury and Whitstable Railway; and to widen the London and Greenwich Railway, which they propose to extend to Ramsgate; and they have also obtained acts for enlarging the station at Ashford, as a central locomotive depot; for making a railway of 2½ m. from the London and Greenwich Railway, which they propose to extend to Ramsgate, and for the formation of a branch to Ramsgate Park; for a line of 25½ m. from their Tumburidge Wells branch to join the Rye and Ashford extension of the Brighton, Lewes, and Hastings Railway near Hastings, with a running line of 6 m. towards Rye; for a branch of 1½ m. from Rye to Rye Harbour; and for authorising the purchase of the Gravesham, Dartford, and Gravesend Railway, about 15 m. from Dartford Junction.—The Brighton, Lewes, and Hastings Railway, which is amalagamed, as the South Staffordshire Railway, a branch of 8½ m. to Darenth; a branch of 32½ m. to Mote End; a branch of 29 m. to Chilham; a branch of 24½ m. to Willingham, and a branch of 12½ m.; act passed 1846. See Birmingham, Wolverhampton, and Dudley.
of less than 1 m. The gauge of the line is 4 ft. 8½ in. See Aberar

Taw Vale. [P. C. p. 265].—An amendment act passed in 1845; and in 1846 the company obtained powers for extending the line from Barnstaple Junction, and the London and Birmingham Railway at Credenhill, a distance of nearly 31 m. An arrangement for leasing the line to the Bristol and Exeter Railway Company has been completed.

Tanley, Sandfordsfoot, and South Wales. — The act, passed in 1846, is for making a railway to connect the Sandfordsfoot Rail-

Wheslade. — From Skipton to the Leeds and Thirsk Railway at Arthington, 21 m.; and two short branches, one at Skipton and one to form a second junction with the Leeds and Thirsk

Railways of Scotland.

Aberdeen.—From Aberdeen to the Arbroath and Forfar line at Friockheim, 494 m.; branch to form a second junction at Guthrie, 792 m.; Forrester branch, 2 m.; Brechin branch, 34 m.; total, 55 m.; act passed 1845. To lease the Arbroath and Forfar Railway. See also Dundee.

Dundee Junction.—From Airdrie to Bathgate, nearly 141 m.; branch to Whithorn, 15 m.; Branch to Blackbank nearly 20 m.; total, 20 m. Act passed 1846, and gives power to lease or sell the line to the Edinburgh and Glasgow Railway Company.

Ayrford.—From Kintore to Alford; length nearly 16 m.; act passed 1846.

Airdrie and Forfar. [P.C. p. 265.].—An act of 1846 sanctions the leasing of the line to the Aberdeen Railway Company, in consequence of which the gauge will be widened to 4 ft. 6 in. and a station will be laid.

Arrochar (formerly Johnstone and Arrochar). [P.C. p. 265.]—Gauge originally 4 ft. 6 in., but altered to 4 ft. 8 in. The repairs to the works on the Glasgow, Paisley, and Greenock line to the Glasgow, Kilmarnoch, and Arrochar Railway Company, Ayshire and Bridge of Weir.—From the Glasgow, Paisley, and Coltness Railway, to Kilbrackan; 1 m.; total length, 5 m.; act passed 1846. Sold to the Glasgow and Ardrossan Railway Company.

Ballyconnel.—From the Paisley and Ayr Railway Company Balllochney. [P. C. p. 266.]—Gauge originally 4 ft. 6 in., but to be altered to 4 ft. 8 in., under an act of 1845. See Monkland Railway.

Caledonian.—Main line, from Carlisle to Carrawath, 720 m.; thence to Edinburgh by a branch of 274 m.; and by another branch to the Wishaw and Coltness Railway, by which is formed the Clyde and Caledonian Junction line, by which it approaches Glasgow. The original act, passed in 1845, also sanctions branches to the Scottish Central Railway and the West Country and Worcestershire and Irish Counties, and several minor junctions, making in the whole 1871 m. Under several acts of 1846, the amalgamation of the Clyde and Caledonian Junction with this Company, and the purchases of the Glasgow, Garnkirk, and Coatbridge line, are sanctioned; and the Caledonian Company are empowered to deviate their line 2 m. near Castletownshend, and to deviate 1 m. of the Clyde and Caledonian 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 Casterley branch to the Glasgow, Garnkirk, and Coatbridge Railway. See also Glasgow, Barburry, and Nellston Direct; Glasgow, Kilmarnoch and Arrochar; Glasgow Southern Terminal; and Scottish Central. The company also proposes to amalgamate with the Caledonia and Dundemortonshire Junction. According to the terms of the act, which was passed in 1846, this is a railway from Glasgow to Dunbarton and Lochleven, 'with branches to Helensburgh and other places.' The length of the main line is 109 m.; of the branches, 197 m.; total, 306.

Clyde and Caledonian Junction.—From the Paisley and Govan Railway at Rutherger to Hamilton, with a branch to the Wishaw and Coltness Railway at Motherwell. Main line rather over 8 m.,Motherwell to Coatbridge, and another short branch 14 m. in the whole. Act passed 1845. Amalgamated with the Caledonian Railway, which see.

Clydesdale.—See Glasgow, Paisley, Kilmarnoch, and Ayr.

Tye-side.—From Ferryhill, near Aberdeen, to Aboyne; length, 29 m. The act, passed in 1846, confers powers for leasing the line to the Scottish Central Railway Company, whose line it joins at Dunblane.

Dundee and Arbroath. [P. C. p. 266.]—Gauge to be altered to 4 ft. 8 in. An act of 1846 authorizes a branch to Broughty Ferry Castle, and a branch to the Arbroath and Forfar line at Almerieloch. Length, under 14 m.

Dundee and Northyke. [P. C. p. 266.].—Leased to the Dundee and Edinburgh. Original gauge, 4 ft. 6 in.

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 Northyke Railway.

Dumfries.—To connect coal-fields with the Monkland canal. Length 1 m.; act passed 1843.

Dumfries.—Main line, to the railway station of the Edinburgh and Glasgow Railway to Bathgate, nearly 114 m.; Mid Calder branch, nearly 24 m., Binny quarries branch, 13 m.; Whithorn branch (from Barrack), nearly 54 m.; Whithorn branch (from Bathgate), nearly 3 m.; total, about 284 m.; act passed 1846. Leased to the Edinburgh and Glasgow Railway Company.

Edinburgh and Leith. [P. C. p. 266.].—Original gauge, 4 ft. 6 in. Act of 1846, and to be improved for locomotives, by the North British Railway Company.

Edinburgh and Glasgow. [P. C. p. 266.].—Opened February 1842. An act authorized on 23rd March 1841 to join Edinburgh and Glasgow, to join the North British and Edinburgh, Leith, and Grainstone Railways at the North Bridge, which extension was opened in January 1846, by an act of 1845 authorizes the leasing of nearly 64 m., consisting of the Edinburgh, Leith, and South Queenferry. Arrangements were made by the Directors for amalgamating with, purchasing, or leasing, the Monk to Kirkcaldy railway; total, 414 m. of the 464 m. of the Edinburgh, Leith, and South Queensferry, which will be laid.

Adjoining Railways.—In 1846, the company proposes to amalgamate with the Edinburgh and Northern Railway Company.

Edinburgh and Leith, and Granston (originally Edinburgh, Leith, and Newhaven). [P. C. p. 266.].—The name was changed in 1844, by an act which supplied the gap between Edinburgh and Leith, and one of 1 m. to Granston. The total length of the present line is nearly 43 m. Part of the main line was opened in 1846, and the branch was resumed to Newhaven in 1846. The company proposes to amalgamate with the Edinburgh and Northern Railway Company.

Edinburgh, Leith, and Northern.—By the original act of 1845 this is a main line of 304 m. from Berwick-on-Tweed, on the Firth of Forth, to Perth, with a branch of 34 m. to Cupar or Cupar, and one of 1 m. at Aikness to Cupar, and one of 1 m. to Perth, and one of 1 m. to Granston, and one of 1 m. to Newhaven. The company proposes to amalgamate with the Glasgow, Garnkirk, and Coatbridge Railway, which see.

Garinish and Glasgow. [P. C. p. 266.].—The original gauge of this line was 4 ft. 6 in., but, as stated there, 4 ft. 8 in.; but it was not an act for increasing the width, but an act for leasing the line to the company to be increased to that width. By an act of 1844, authorizing extensions to the amount of 427 m., it was provided that the company was changed to the Glasgow, Garnkirk, and Coatbridge Railway, which see.

General Terminus and Glasgow Harbour.—From the Police and Govan Railway to the river Clyde and the harbour of Glasgow, 1 m.; with branches to the joint line of the Glasgow, Paisley, and Greenock, and Glasgow, Paisley, Kilmarnoch, and Ayr Railways, and to the Harbour, Barburst and Helensburgh Direct line; total length, under 22 m.; act passed 1846.

Glasgow, Airdrie, and Monkland Junction.—Main line, from Glasgow to Airdrie, 101 m.; branches to the Clyde and Junction and Garvick Extension lines, and to Mile-end, 4 m.; total, 145 m.; act passed 1846. Leased to the Monkland Mineral Railways, which see.

Glasgow, Barrhead, and Nellston Direct.—From Glasgow to Croftend, 104 m.; branches at Greenock, 130 m.; branches at Greenock and Coltness to Greenock, and Kilmarnock and Ayr, and to the Glasgow, Barrhead, and Nellston Direct line; total length, under 22 m.; act passed 1846.

Glasgow and Belfast Union.—From the Glasgow, Paisley, Kilmarnoch, and Ayr line (to the owners of which it is to be made over) to the line of the Belfast and Northern Counties Railway, 4 m.; to Maybole; act passed 1846. This is only a part of a contemplated

Glasgow, Dunfries, and Carlisle.—From the Glasgow, Paisley, Kilmarnoch, and Ayr Railway, near Cannock, to the Caledonian Railway near the crossing of the river Sark, nearly 65 m.; Canock branch, 8 m.; Ainslie harbour branch, under 1 m.; Cawrick branch, 141 m.; total, 89 m. Act passed 1846. To be
amalgamated with the Glasgow, Paisley, Kilmarnock, and Ayr, and the portion from Newcraighall to Gretna to be worked by the Caledonian Railway Company.

Glasgow, Garnkirk, and Coatbridge. — This railway is the line originally called the Garnkirk and Glasgow (which see), as extended under an act of 1844 by new lines, one of which joins the Wishaw and Coltness, to the extent of 24 m. Of these the Garnkirk and Coatbridge extension, of rather more than 16 m., opened in 1845, is the first act obtained with a view to widen the gauge to 4 ft. 8 in. Under three new acts of 1846 the line is transferred, by sale, to the Caledonian Company, and an extension of 10 miles was sanctioned. The line, and the new branches mentioned under Caledonian are sanctioned.

Glasgow Junction. — From the Edinburgh and Glasgow Railway, crossing the Forth near Portobello, to Fetteresso, in Morayshire.

Glasgow, Kilmarnock, and Ardrossan. — From the Glasgow, Barrhead, and Neilston Direct Railway at Crofthead to Kilmarnock, 14 m.; Ardrossan branch, nearly 108; Irvine branch, 34 m., and some smaller branches; total length, about 349 m. Act passed 1846. The company have purchased the Ardrossan Railway and Harbour; and the line has been projected in connection with the Caledonian.

Glasgow, Paisley, and Greenock. [P. C. p. 266. — Opened throughout in March, 1841. Acts of 1846 authorize a branch of 1 1/2 m. from Greenock to the new Harbour at Port Glasgow; from Greenock to the new Harbour at Gourock.
Percy and Inverrowen Railway, (a scheme abandoned for the present during the session of 1846), to Aberfeldy; length nearly 93 m.; act passed 1846.

An Act to incorporate the shipper, and Colman, (originally called Shute and Wiltonstown).—A mineral line of about 85 m. is extension of the Wishaw and Coltness Railway; made under an act of 1841, and opened in June, 1845. An act of 1846 authorises the line, and the construction of branches from it of nearly 14 m. to Shotts, of nearly 44 m. to Climping, of 52 m. to Bathgate, and of 83 m. to join the Caledonian Railway.

Local and Colman. [P. C. p. 286.]—An act of 1846 authorises the construction of a line of nearly 23 m. from near the southern termination of the Caledon branch to Mudirudorf, with a branch from it of rather more than 6 m. to Goodickhill, in the parish of Shotts; 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 will be substituted for the intended amalgamation.

RAILWAYS OF IRELAND.*

Belfast and Ballymena.—Main line nearly 38 m.; Carrickfergus branch 3 m.; Sandilands branch 2 m.; total 38 m.; act passed 1845.

Belfast and Carnew. [P. C. p. 286.]—An act of 1845, 30 m. of the line was to be from Belfast to Downpatrick, 24 m.; with branches to Holywood, Newtownards, Bangor, and Donaghadee, amounting to 30 m.; total length, 65 m.; act passed 1845.

Clonmel and Thurlow.—From the Waterford and Limerick Railway at Clonmel, to the Great Southern and Western Railway at Clonmel, by a branch to the Severn Collieries, 104 m.; total length, 184 m. Act passed 1846. Sold to the Great Southern and Western Railway Company.

Cork and Portarlington. Main line, 60 m.; act passed 1845.

Cork, Blackrock, and Passage.—From Cork, through Blackrock, to Passage West; length, 66 m.; act passed 1846.

Cork and Waterford.—Main line, 78 m.; branch to Fermoy, 18 m.; a branch to Tramore, 1 m.; total length, 97 m.; act passed 1846.

Dalkey.—See Dublin and Kinsgstown.

Dundalk and Collon Line Junction.—Main line from Armagh to Portrush, 70 m.; branch to Dundalk, 13 m.; branch to Ballymoney, 41 m.; total length, 121 m.; act passed 1846.

Dublin and Belfast Junction.—Main line, from Drogheda to Portadown, 56 m.; branch to Navan, 17 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. 286.]—Open May, 1844; gauge 5 ft. 3 in. An act of 1845 authorises the Howth Branch, 33 m. long, the greater part of which was opened in July, 1846. The company has purchased the joint branch of the Dublin and Belfast Junction, which see.

Dublin, Dundrum, and Rathdrum.—Dublin to Dundrum, ranging by Kilbride, to Rathburnham, over 21 m.; total length, nearly 53 m.; act passed 1846.

Dublin and Kingsbridge.—[P. C. p. 286.]—An extension of 18 m. to join the Great Southern line was made without the sanction of act of parliament, and opened in March, 1844. It follows the line of a tramroad made by the Commissioners of Kingsbridge, which was authorised by an act of 1846, and extends from Millmount to the bridge of Ballyclogh. 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 36 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. 286.]—Abandoned.

Dundalk and Kingsbridge.—See Kingsbridge and Great Southern and Western.

Great Leinster and Munster.—Owing to financial condition, and the increase of 1841, was never carried into effect. The Great Southern and Western line has superseded the Great Leinster and Munster between Dublin and Cabra, and the company was winded by one of the provisions of 1841 from Kilkeny to Clonmel. The Wexford, Caslou, and Dublin Junction line is to be amalgamated with this undertaking under the new name of the Irish South-Eastern Railway.

Great Southern and Western.—Main line from Dublin to Cashel, 984 m.; branch from Monasterevin to Carlow, 54. For these the act in 1846 was passed in 1846. A second act in 1846 sanctioned an extension of 77 m. to Cork, with a branch of 41½ m. to Limerick.

The gauge of all Irish railways is required to be 5 feet 3 inches, in accordance with a recommendation made by the Board of Trade in 1842.

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rick. 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, sanctioned the extension of nearly 1 m. to the river Lee at Cork. Of the original route the portion between Dublin and Cashel, about 564 m. was opened in August, 1846. See also Cork and Clonmel; Limerick, Ennis, and Killaloe Junction; Milford and Foreway; Waterford and Limerick, Kilkenny, and Waterford; this last, which see.

W. Return.—From Kilkenny to the Great Southern and Western Railway near Cuddagh; length 36 m.; act passed 1846. Part of a much more extensive scheme called the Waterford and Limerick Railway. Power given to lease or sell the line to the Waterford and Kilkenny Railway Company. Kilcreggan Junction.—From Mallow to Killkenny, length 283 m.; act passed 1845.

Limerick, Ennis, and Killaloe Junction. Main line, from Limerick to Ennis, 264 m.; branch from Limerick to Killaloe, Waterford and Limerick, and Ennis. Dublin, and Killaloe Junction with Great Southern and Western, 3 m.; total length, about 37 m.; act passed 1846. Power given to lease or sell the line to the Great Southern and Western Railway Company. Kilcreggan Junction.—From Mallow to Kilkenny, length 283 m.; act passed 1845.

Limerick, Ennis, and Killaloe Junction. Main line, from Limerick to Ennis, 264 m.; branch from Limerick to Killaloe, Waterford and Limerick, and Ennis. Dublin, and Killaloe Junction with Great Southern and Western, 3 m.; total length, about 37 m.; act passed 1846. Power given to lease or sell the line to the Great Southern and Western Railway Company. Kilcreggan Junction.—From Mallow to Kilkenny, length 283 m.; act passed 1845.

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or their situations on his instrument, names wholly different from those in the copy placed before him. To accomplish this he has to suppose a change of clef, or clefs, and thus give new designations to all the lines and spaces. For instance—and without going into the extreme case of transposing from a score—a pianoforte player is required to transpose an air a whole tone lower, from A to G. For this purpose he must assume a change of keys, and, the transposition made, the tenor, and each note to be played an octave higher than it is written; the base into the alto, and each note to be played an octave lower than it is written. Example in A.

The same as read by the performer, when transposed to G.

The difficulty attending this process is so great, that no amateur, and few discreet musicians, unless professed accom­panists, or well acquainted with the composition to be trans­posed, will undertake the task; for to perform it in an artist­like manner, at first sight, requires a degree of practical skill only to be gained at the expense of much time that might be employed to far greater advantage in studying those higher branches of the art in which the most experienced will always find something to learn. Our remarks, it will be understood, relate to performers on the pianoforte and organ. To those who read from a single staff, and play single notes only, as violaists, flautists, &c., the task of transposing is comparatively easy.

To meet all the demands of Transposition, a familiar knowl­edge of no less than seven clefs is necessary, and two of these—the mezzo-soprano, and baritone, or bass clef on the 3rd line [Clef, F. C.]—may be said to have become obso­lete, for we venture to assert that not one musician in five hundred is practically acquainted with either.

The annexed table will exemplify the use of clefs in transposi­tion. It shows how to transpose a given key-note—A for instance—into any other note of the scale, and, conse­quently, how to transpose the whole of any composition. It is hardly necessary to add, that the semitone scale, as con­cerns line and space, is governed by the diatonic; that A, A♭, &c., have the same places in the staff as the natural notes represented by the same letters.

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,'—'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

TRAVERSE. (PERSANDE, P. C.)

TRENASON. [Law, CRIMINAL, P. C.S.]

TRENTON. Antonio de Ridolfi, 1768, few necessary, the Chelouidm

TREVIGI, or TREVISO, GIROLAMO DA, born at Trevigl in 1508, was apparently the son of the painter Pier­maria Pennacchi, 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 combined 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 St. Antonino of Padua, in oil, in the cathedral. He left Bologna in consequence of the superior fame of Pietro­ da 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 Boulogne, and was there killed by a cannon-shot, in his 36th year.

There are some fine portrait paintings of 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 at Rome; it is a half-length of a man in the pictureque costume of the period, and is probably a signature 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 Guicciardini, was Girolamo's masterpiece, is now in the collection of Mr. Solly, in London: it was for­merly in the church of San Domenico at Bologna.

There was an earlier painter called Girolamo da Trevigl by whom there are still works bearing dates from 1470 to 1540; his surname according to Federici was Aviano.

(Vasari, Vite de' Pittori, &c.; Bartich, Figuren-Graevur; Neumann, Algebrograevur, Lexicon.)

TRIESTOSTERNON, a genus of fossil amber from Tigliate forest. (Owen.)

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(Vasari, Vite de' Pittori, &c.; Bartich, Figuren-Graevur; Neumann, Algebrograevur, Lexicon.)

TRICARPELITES, a genus of fossil fruits from Sheppe­ry. (Bowerbank.)

TRICHOMANES, a genus of ferns belonging to the sub-order Hymenophylaceae. The theece are on an elongated rhizome receptacle within a cup-shaped involucre of the same texture with the frond.

T. speciosum is the only British species. It is extremely rare, and very beautiful, combining the characters of the true ferns, mosses, and sea weeds. In texture as well as in color it resembles some of the marine algae, and it is found to assume the same life-like appearance when immersed in water after being kept perfectly dry for many years. It is found at Kil­larney, Wicklow, and on the beach at Inch in Ireland.

The soil which seems to suit it best is a mixture of loam and sand, interspersed with pieces of turf.

(NEWMAN, British Ferns; BAILING, Manual of British Botany.)

TRICHONEMA, a genus of plants belonging to the

TRICHTON, or TRICHTON, TERRA, 1560, S. and F. C., an

TRICHROMIC, or TRICHROMIC, TERRA, 1560, S. and F. C., an
TRIANGLES, 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 capsule is many-seeded, opening with a revolute falcate valves. The seeds are invested with a reticulately tunic. T. europaeus has oblong oblong obvolute obwisp, 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 capsule soon fall off. It is native of England and the Highlands of Scotland. (Babington, Manual.)

TRIGLA, a genus of Acanthopterygious osseous fishes, popularly known as Gurnards, and belonging to the family Serranidae in the arrangement of Cuvier. The head of Triogla is broad and angular: the opercle and subopercle are armed with spines; the body is scaly: there are two distinct dorsal fins; beneath the pectorals are three detached rays; the branchiostegous membrane has seven rays; both jaws and the front of the vomer are armed with sharp teeth. The gills are separate, the gill-covers are concave, the gill membranes are united behind the branchiostegous membrane. The head, trunk, and pectoral rays are covered with a thick, silvery, and often glossy coat.
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UDAL TENURE. [Shetlands, P.C., p. 365.]

Ulodendron, one generic division of the great group of Lepidodendroid 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 Diffraction, and to Polarization of Light (P.C.), also to the following articles, which have been introduced in this Supplement: Circular Polarization; Colours of Planets; Elliptical Polarization; Polarized Movements; Polarized Rings; Swiftest Propagation, Principle of; and Vibrations of Light.

UNION OF ESTATES. [Merger, 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 29th 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 Fossa 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 main main stream to the seashore, 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 the 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 1500 dollars per annum. The Senate consists of 18 members, elected for six years; the House of Representatives of 53 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 Chanceller 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 Judges 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 period of seven years. There are four judicial circuits, in each of which one of the Judges of the Supreme Court presides. The University of Michigan, which was opened at the end of 1832, has since been gradually increasing. At the end of 1846 the main institution at Ann Arbor had about 70 students, and the five branches, or preparatory schools, at Tecumseh, Romeo, Kalamazoo, White Pines, and Ann Arbor, about 180 students. The professorships were—1, Greek 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 66,016, and the amount appropriated from the state treasury among the several districts was 28,963 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 212,307. 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 be exempt from service therein. No laws are to be passed to emancipate slaves, or to prohibit the importation of persons for the use of slaves with them. The General Assembly may prevent free coloured persons from entering the State. The population in 1830 was 54,750; in 1840 it was 54,447, of whom 29,717 were slaves. (American Almanac, 1837, 1845, 1846.)

Uranoscope, a genus of Acanthopygeous oceanic fishes of the perch family, and very nearly related to the weavers (Tachinina) of the British seas. One or two species inhabit the Mediterranean. The head is nearly cubical, and the eyes placed in the flat summit, so that they look upwards; hence the name. The mouth is turned up in a similar manner. This arrangement agrees with the habits of the fish, which lives itself in sand all but the summit of the head, and thus lies in wait for its prey. Its colour resembles the sand in which it lives.
V.

VACHELLIA, a genus of plants belonging to the natural order of Leguminosae, is divided into five species, the 5-toothed; the corolla tubular, gamopetalous, and 5-toothed. The stamens are numerous and distinct; the legume cylindrical and turgid, scarcely dehiscent, filled with pulp, and a dozen or more seeds. 5. *Farnesiana* is a native of the East and West Indies and Africa. It is a large shrub or small tree, with straight thorns. The leaves are bipinnate, the leaflets linear and nearly flat; the peduncles and petioles more or less hairy; the flowers capitate, the heads globular, 2 or 3 together, each on an axillary peduncle. The bark exhibits a considerable quantity of gum. The flowers when distilled yield a delicious perfume.

(Lindley, *Flora Medica*.)

VAILLANT, WALLERANT, a very distinguished portrait painter, was born at Lille in 1625, and was the pupil of Erasmus Quellius, 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, and was there equally distinguished by the French court. After having amassed considerable riches he died at Amsterdam, in 1677.

Vaillant was employed in 1656 at Brussels by Prince Rupert to assist him in executing some plates in the new method of measuring time then communicated to him by Siegen (Siegen, Ludwig von, 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—Print Robert, of 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.

(Desenfans, *Vies des Peintres Flamands, etc.; De Lalive, *Histoire de la Gravure en Matiere Noire*.)

VALENS, AURNHANUS, a Roman jurist, whose age is partly determined by the fact that he cites Juvencus and Julius (Dig. 4, tit. 4, s. 33), from which we may conclude that he was younger than both. He is called Aurnanus in the Florentine Pandect. He was a Sabinius, as appears by his being placed by Pomponius among the followers of Juvencus. It appears that he was living under Antoninus Pius (Capitol., Pont. 19), and except the text, as Carolo gives, he is called Salvius Valens. His complete name may have been Salvius Aurnanus Valens; or Salvius in this passage may be separated from Valens and mean Salvius Julius. But there is a rescript of Pius (Dig. 49, tit. 2, s. 7, § 2) addressed to Salvius Valens.

Valens wrote seven books on Fideiconcimmissa, 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 Antics. Valens is mentioned by Pomponius, and cited several times by Paulus (Dig. 4, tit. 4, s. 33).

VALABOR. [TAVASOR, P. C.]

VAN, or WAN. [TAVLASSOR, 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 afterwards 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 1652.

Van Hoock was admirable in history and portrait, and excelled both in light and shade and colour; his figures also are better drawn than is the case with those of the pupils of Rubens. He made several copies of the "Christ in the Cross" in the church of Saint-Sauveur, or the cathedral, at Bruges, one of the finest pictures in Belgium. The Christ, which is of the size of life, has extraordinary effect and remarkably superior to the celebrated Christ of the church of St. Michael, at Ghent, by Van Dyck, 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 Galle; this engraver however is not very accurate in his drawings. In the middle of the Christ, the composition of the picture is meager and formal, and wants dramatic truth.

VARIATION OF PARAMETERS. A parameter was at one time given a particular conic 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 axis 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 would 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 planetary motions 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 with at that moment, if 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 plane of first importance might be supposed to move in a parabola, which varies its distances and position in a manner to be determined. In *Tropocodals of 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 investigated. If 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 elements are made variable, provided they are made to be variables in a proper manner. Now, if the purpose which is to be answered involves 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 substitute different 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 the differential co-efficients of all expressions into which they enter, and into which these co-efficients enter, alter; and it is necessary to discover what they had before. These new terms, which we may describe as functions of the variations of the elements, must, in the first case above noted, be so taken as to provide for the effect of the alteration, and in the second case, for the effect of the alteration, and also to provide for the effect of the alteration of the altered elements. If the constants they must destroy one another's effects altogether. We shall take a few instances in which the variation of elements is successful or unsuccessful.

P. C. Sc., No. 17.
The equation \( y' + Py = 0 \), \( P \) being a function of \( x \), is solved by

\[
y = Ce^{-Py}
\]

\( C \) being a constant. Now alter the equation into \( y' + Py = Q \) and to meet the alteration, let \( C \) become a function of \( x \). On this supposition \( y' + Py \) becomes

\[
-C'R + Ce^{-Py} + C' = 0
\]

But this ought to be \( Q \); therefore we must have

\[
-C'R = Ce^{-Py} + Q + E
\]

\( E \) being another constant. Here \( y' + Py = Q \) is solved by \( y' + Py = 0 \) and subsequent variation of an element.

Now try \( y' + Py = 0 \) and \( y' + Py = Q \) in the same manner. The first is solved by \( y = e^{x + C} \) and if \( C \) be made variable, and \( y \) thus altered be introduced into the second, it is found, making \( x = C + x \), to require the solution of

\[
x^2 + Qx^2 + 1 = 0
\]

as difficult an equation as the original. In this case then we are unsuccessful.

2. Let \( \frac{du}{dx} + \alpha x = a \). One solution of this is \( u = \frac{1}{2} x^2 + \alpha x + b \), \( a \) and \( b \) being constants. To find a more general solution of this same equation let \( b \) be a function of \( a \\ a \) being a function of \( x \) and \( y \). We have then

\[
\frac{du}{dx} = x + a + \frac{d}{dx}(x + b)\frac{da}{dx}
\]

It is to be remarked that we found them, or that we can solve this equation, if \( a \) is fixed and \( b \) is variable, and the equation will obviously still be satisfied if \( a \) and \( b \) are related so that

\[
x + y + \frac{db}{dx} = 0
\]

Now as \( b \) is what function of \( a \) we please, so also is \( db \). Hence it follows that if \( b = \phi(a) \), and \( x - y = \psi(a) \), we may make \( a \) what function of \( x - y \), we please. Let \( x = \psi(a) \), and let \( y = -\psi(a) \).

We have then

\[
\frac{u}{2} = \frac{1}{2}(x + b)(\psi(a) + b) + b = a
\]

\( \phi \) meaning any function whatever.

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 that hooks will give to them. It is to be remarked that this method does not merely search for solutions of a question: if the number of constants be sufficient, it goes direct to the most general solution. In our first example, this is the function of \( x \), but what is capable of being represented by \( C'e^{-Py} \)? In our third there is no function of \( x \) and \( y \) but what is capable of being represented even by \( y^2 + a(x - y) + b \) and also by

\[
1\left(1 + \frac{a}{x^2} + \frac{b}{x} \right)
\]

\( x \) or \( x \) and \( y \), will solve these equations, is sure to be found, if the method is successful. This point would need a little more development than we have here space to give.

**VEGETABLE MORPHOLOGY, or METAMORPHOsis.**

This 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 govern either the external or the internal forms of plants, or those which influence the production of various forms in the same individual at different periods of its existence, or of the same species under unlike circumstances.

Linnaeus, 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 higher plants, 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 Linnaeus was one of the first to enunciate the laws of morphology, yet even in his time published scientific works on the subject were not numerous. The whole story of the development of the flower and of the leaf was thus apospherically proclaimed by the great Swede, 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 names in the subject were W. H. Goethe, who at a very early age, in 1780, published a work on the vegetable philosophy of morphology, which was then the secret of the generation and organization of plants, and that it is the simplest thing that can be imagined. It was some years after that he first published his poem on the metamorphosis of the vegetable kingdom, which is the main subject of this part of the book. It consisted of three parts, and was dedicated to the memory of the great Swedish botanist Linnaeus.

This was followed by a paper on the subject, in which he clearly points out the importance of this idea of the unfolding of a primitive type. At the time these papers were published they were regarded as the fancies of a poet rather than the sober realities of scientific 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 practical signification of the morphological idea in the arrangement of the various families of plants. The idea of Goethe was adopted by De Candolle, in his doctrine of a primitive type among plants, from which all departed by the decrease, increase, and adhesion of their organs. In this way the doctrine of morphology has more or less influenced the greatest botanical observers of the present day, and it assumes a position of 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 the various series of plants and of individual organs. This latter department is by far the most extensive 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 others treat of the internal form which the various tissues of the plant assume.

There are certain general principles in morphology which have been expressed by the author of the descriptive characters and the systematic arrangement of plants, for example Cyclopedia, and many Cyclopedia, which has an ascending and descending axis; the former of which is the stem (Exogenes, P. C.); and the latter is the root (Root, P. C.). These may be traced downward through the various series of plants downwards till we arrive at a point where the cells exhibit no tendency to either an ascending or descending growth, as in the cells of Protozoa; or upwards till the increasing development of the stem exists in the most complicated organs. 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 distinguish the higher than the lower plants, and in many of the phenomena of the latter, general laws as general 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 determinate point of departure from which the others are formed, and from which they are...
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 sepal from the bract, the carpel from the petal, the carpel from the petals, the carpels from leaves, and the ovules from kel-kulbs.

This is the series of gradations which prove the positions of morphology. When these gradations take place, as they usually do, between the different 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, in the vegetable kingdom, given rise to objects 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 stipules 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 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 pear 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 branch. The admission of these principles has led to the examination of each separate organ of the flower and fruits of plants, and being applied to their peculiarities, are the best means of securing a natural classification.

It is apparent that the number of leaves must normally alternate with that which preceded it. 2. That the number of parts in every series must be equal to or a multiple of the number of parts in the first or outer series. The actual departures from this theoretical structure are numerous, but they may be reduced to the simple conditions of the increase, decrease, or alteration of the various organs, which also obey definite laws.

(Vegetation in Change. Introduction to Botany, 2nd edition; Goethe, Metamorphosen der Pflanzen; Linnaeus, Philosophia Botanica; De Candolle, Théorie Elémentaire de Botanique; Schiede, Grundzüge der Wissenschaftlichen Botanik.)

VELLA (Latinised from Velecro, the Celtic name of the grass), a genus of plants belonging to the natural order Crucifera. It has an ovate pouch, with a dilated winged leafy flat style, longer than the corolla valves. The flowers are yellow, and are, as well as the pod, erect.

V. annua was found in the time of Ray on Salisbury plain, but has since been noticed. It has doubly pinnatifid leaves, and sessile flower on peduncles. V. pseudocynus, False Cyprian, or Cress-Rocket, is a native of Spain; it has yellow petals with long dark purple claws; the larger stamens are connate by pairs; the seeds two in each capsule.

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 bell-glass.

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

VENÈRE INSPICIENDI, WRIT DE. When a woman is suspected to feign herself with child in order to produce a supposititious heir to the estate, the heir presumptive may have a writ de venire inspiciendo, to examine whether she be with child or not; and, if she be, to keep her under parental restraint. The suit is entirely conformable to the practice of the civil law: but if the widow, upon due examination, found not to be pregnant, the presumptive heir shall be admitted to the inheritance, though he hath to lose his suit, on which account, it is said, he may go about the这条s from the death of a husband (Blackstone, Comm. 1. 456).

The Roman practice is explained in the Title of the Digest (25 tit. 4): De inspiciendo venire custodiendique partu.

This title of the Digest is the most rankling of the law, in a case in which a wife denied her pregnancy and the husband maintained it. The wife had separated from the husband, and probably wished to keep the child that might be born, though by law it had not the right of inheritance. The husband 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 (quia venitum inspiciens). All the proceedings of inspection and of watching the woman, if she should be reported to be with child, are minutely described in the Praecox'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 Posemiss.

The form of the English writ De Venire Inspectando is given (Co. Litt. 6 b.), it is directed to the sheriff, and compels him to cause the woman to be examined, and to cause her to be inspected. If they find that she is with child, another writ issues, which commands that she shall be safely kept and duly inspected by the women, who must be present at the delivery. Brenton 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.)

VENÉRIL, PIETRO MARTIRE, born at 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 a Spaniard, who had become a convert to the doctrines of the Reformation. Vernigili adopted some of those tenets, but concealed them for a time. Being sent by his superiors to the University of Lucca, as prior of monks, he there published a new doctrine, and was soon after compelled to fly to Switzerland, in 1542. He thence went to Strasbourg, where he was appointed Bishop of Strasbourg. In 1547, at 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 Strasbourg, where he resumed his chair as Professor of Philosophy. In 1556 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 Poissy, in France. In the following year Vernigili 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 Lucca,' to the Protestant churches in Poland, to the English church, to Calvin, Bullinger, Beza, Melancthon, and other reformers, to Queen Elizabeth, and to several English prelates and noblemen. Trutboch, and Vincent, the Catholic prelates, were free from the arrogance and virulence of Luther and other Reformers, that he was deeply acquainted with the Scriptures and the fathers, and was one of the most learned writers of the reformed communion. His works were translated into Latin into English. 'The Common Places of the most famous and renowned Divine Doctor Peter Martyr, divided into four principal parts by Anthony Marten,' dedicated to Queen Elizabeth, in 1658, with a biography of Vernigili by Josias Simler, of Zürich: this collection contains a complete course of Christian ethics, and may be read with advantage even now. (Don, Gardener's Dictionary; Babington, Manual of British Botany.)

VÉNET, 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, and 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 for a large picture of the Triumph of Being at Naples; he became acquainted with Johann Widmann, a nobility 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,
the Battle of Rivoli, and another picture of the Emperor, in 1810; John Sobieski forcing the Turks to raise the Siege of Vienna, in 1689, exhibited in 1819; The Taking of Pampluna, The Entrance of Napoleon into Milan; and the Battle of Wagram.

Carle Vernet has painted also an immense number of pictures of horses, both the living and in motion, and of the most favourite subjects, as also many of the chase, of scenes of familiar life, and from the imagination. He was also a celebrated painter of horses, and by some considered the best of his time; among his pictures are many small equestrian compositions, several subjects of which are also inconsiderable, which exhibit a patrician air, and a spirit of freedom and imagination. He was in 1816 appointed painter to the Dépôt de la Guerre: and he was made subsequently Chevalier of the orders of St. Michel, and of the Légion d'Honneur. He died September 27, 1836. However, he was not able painter for the most prolific pencil of the present century, is the son of Carle Vernet, and was first instructed by him in his art.

(*Gobet, Dictionnaire des Artistes de l'Ecole Française au dix-septième Siècle.*)

VESTED REMAINDER. *Remainder, P. C.*

VIBRATIONS OF HEAT. *Heat, P. C.*

VIBRATIONS OF LIGHT are the movements conceived to take place among the molecules of an aetherial medium which is supposed to exist in space and even to occupy the interiors of bodies; they are the cause of the waves by which are obtained perceptions of light and vision; and the relations of these vibrations of the molecules of air by which sound is excited. From experiments which are alluded to in the article *Umboldt's Theory of Light,* P. C., p. 512 it has been demonstrated that, if we call the velocity of a wave, the squares of the velocity at the violet extremity is 0-00000062 inches, and for the light at the violet extremity is 0-0000107 inches; hence it follows that the number of undulations which are made in air, in one second of time, is, for the first kind of light, about 458 millions-and, and, for the last, about 277 millions, it follows that, if unity be divided by each of these numbers, the quotient will express the very small fraction of a second in which a complete vibration is performed in air by a molecule of the luminoferous aether.

The waves of sound move in air through less than 1200 feet per second; and it follows that the velocity of light is more than 900,000 times greater than that of sound; but the velocity of an undulation varies with the square root of the elasticity of the medium in which it is propagated; and hence it should follow that the elasticity of the luminoferous aether is to that of air in a ratio exceeding that of the square of 900,000 to unity.

Undulations of the luminoferous aether are presumed to take place within the substances of all refracting media, as air, water, glass, &c.; but it is probable that the vibrations of the aetherial molecules in such substances are modified by the vibrations of the molecules of the substances; the observed phenomena of refraction render it necessary to consider that the greater is the refracting power of a medium, the less is the elasticity of the aetherial molecules within it and the greater is the degree of vibration to which the waves of light are propagated through it.

The aetherial vibrations which, by affecting the retinae of the eye, give rise to the sensations of light, take place, as above stated, with great rapidity, but the impression made by any single vibration is inconsiderable; therefore, in order that the combined actions of the vibrations molecules may be sufficiently powerful to produce effects which are sensible, it is necessary to suppose that the vibrations are performed in equal intervals of time, the intervals depending on the nature of the vibrations of which the retina is susceptible; as in order to give motion to a pendulum by a repetition of very small forces, these must be made to act at the end of equal intervals of time which depend on the length and form of the pendulum. The particular colour of light is made to depend on the velocity of the aetherial molecules, or on the extent to which those molecules vibrate on each side of their mean places; and whatever be the number of vibrations made by the particles of ether in a given time, that is, whatever be the velocity of the vibrations, it is to be understood that the laws of the propagation of motion in elastic media, that the velocities of the waves of light are uniform in every direction. The intensity of the impression of light in the eye depends on the density of the aetherial molecules, or on the extent to which other aether vibrate on each side of its point of rest. *Umboldt's Theory of Light,* P. C., p. 510.

In common or white light, the vibrations of the aetherial molecules may be conceived to take place in any manner, but M. Fresnel assumed that when light is polarized, the eye is affected by a continuance of the aetherial vibrations. Therefore, if a series of vibrations be made with their planes in planes perpendicular to the direction of the motion of the wave or ray, the vibrations in this direction, if of the same nature, will reinforce each other, forming a bright line; but if of different natures, the vibrations will interfere with each other, and a dark line will be formed. 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 small angle, the waves of light are refracted so as to form a bright line; 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; since if they had, interferences ought to have been observed in the light which was polarized as well as in that which was not so.

For the composition of the vibratory motions in two polarized pencils of waves, similar experiments with electric vibrations are produced, see *Circular Polarization,* P. C. S.

VICTOR, CLAUDE FERRIN, Duke of Belluno and Marshal of France, was born at La Marche, in the Department of Calvados, in 1794, in the seventeenth year of age when, on the 16th of December, 1781, he enlisted as a private soldier in the 4th regiment of artillery, at that time in garrison at Amiens. He had obtained his discharge when the evacuation of the Revolution of 1789 occurred. He was, however, destined to more important and intrepid soldier to raise himself from the lowest rank to that of adjudant-major and chef de bataillon. With the bataillon under his command he distinguished himself at Jassy, by foiling the attack of three thousand Piedmontese and a regiment of emigrants. At the head of the same bataillon he obtained considerable success in 1793, at the siege of Toulon; under the orders of General Lafayette, he gained the important heights of Pharon, and afterwards, with similar good fortune, attacked the Fort de l'Aligüillotte, the capture of which greatly contributed to the favourable issue of the siege. These brilliant actions, in which he was twain wounded, were rewarded by his promotion to the rank of adjudant-general. Transferred to the army of the Eastern Pyrenees, with the rank of general of brigade, he rendered himself conspicuous in the defense of his army (June 22nd, 1794) and Rosas (January 2, 1795). After the termination of the war between France and Spain by the treaty of peace signed on the 22nd of July, 1795, Victor joined the army of Italy and commanded a division on the side of that campaign, and particularly in the action at Borghetto (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 angiographical engagements which took place at Coassa and Mondovi (April 5 and 16, 1796) 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 skillful manœuvre, he greatly contributed to the success obtained by Massena [Masséna, Marschal, P. C. S.] over the Austrian General Wurmser [Wurmser, P. C.] at Corona (August 11, 1797). It was on account of his successes during this campaign, of which we have enumerated a very small part in this, 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 the enemy had been dispersed was intrusted with the command of the army which was composed of twenty pieces of cannon, and a garrison of five thousand degenerate Romans. General Victor," says Napoleon, "crossed
the Po at Borgo 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 Labez. By his skilful dispositions, and by his conciliatory, but firm and decisive conduct, he maintained the tranquillity of that country. Being recalled, in 1798, to the army of Italy, he was placed, by the head of a large corps of the army of Italy, to the command of the corps of the French army of Naples through the valley of the Formida; 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 surmounting great dangers, he was enabled to effect a junction with the army under the command of General Macdonald. [MACDONALD, MARSHAL, P. C. S.] Victor bore a distinguishe part in the engagement on the banks of the Trebisch, which proved disastrous to the French. He was afterwards sent to Paris by General Moreau, to solicit from the Directory reverses, and, after considerable length of time and many dispositions, he returned to Italy and assumed the command of his division, which acquired fresh laurels at the battle of Basano, where it formed part of the centre under the command of General Moreau.

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 Basan division of the army of Italy, and, in the territory of the Austrian kingdom, he conducted an army of his division in the campaign; 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 by the combined forces of the Prussians and Russians at Pulstuck (December 26, 1806). In this campaign he was taken prisoner by a body of partisans, but, by means of an exchange, he speedily recovered his liberty. The country of the Harz, which he had the honour to visit, and the battle of Germany (June 14), in which Victor, at the head of the first corps of the grand army, so distinguishe himself, that Napoleon, on the field of battle, raised him to the dignity of Marshal of the empire.

After 1808 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 Epinosa (November 4), and Biscarrat (November 22). On the 13th of December, 1808, he routed the remnants of the Spanish army which had been defeated at Tudela [LARENS, P. C. S.]; but, which, reinforced by the French army which had been detached from the northern bank of the Ebro, 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 troops on the right bank of the Ebro were effectually broken by the French. According to the Spanish accounts, this victory was obtained by the exercise of wanton cruelty towards the prisoners, in retaliation for similar cruelty exercised on the part of the French at the battle of Seringapatam. [See NAPIER, 'History of the Peninsular War,' vol. ii. p. 16.] At Medelin (March 28, 1809) Marshal Victor obtained another important victory over the Spanish army under General Cuesta, in which six thousand Spaniards are said to have fallen, and which, though claimed by the French, was never confirmed.

Afterwards sent with his division to the support of Marshal Soult in Portugal; but he had scarcely entered that country, when he was obliged to effect a retreat. Having retired to the coast of Josse (August 27), he was again recalled, and, under the command of General Jourdan, and General Sebastiani, he was induced to attack the army of Sir Arthur Wellesley, which was advancing into Spain. The issue proved disastrous to the French army; but after a long contest, in which the French lost General Elzanans and 5,000 men, they were defeated at Talavera de la Reya (July 28, 1809). This battle however did not materially change the position of the battle armies. [TALAVERA, F. C.] Victor having united his forces with those of Marshal Ney and Mortier, and the British army being obliged to retire before the superior numbers of the enemy, the French were again enabled to occupy the town of Talavera. To the credit of the French command of Talavera, it may be stated that a large number of sick and wounded English soldiers were treated with the greatest kindness.

On February 4, 1810, the duty of investing Cadiis was assigned to Marshal Victor, whose Napoleon had created Duke of Belluno; he conducted the operations of this siege with skill and perseverance, but though protracted for a long time, the position was not attacked. In 1812 he was summoned from the blockade of this town to join the grand army destined for the expedition to Russia, and was appointed to the command of the ninth division. His name stands conspicuous in the annals of the Russian campaign. [BONAPARTE, F. C.] During the retreat, he rendered the most important services to the French army, and in particular to the perilous passage of the Beresina (November 29, 1812), where, with six thousand men, he successfully resisted the efforts of General Wittgenstein [WITGENSTEIN, F. C.] and thirty thousand Russians. His courage in this action was rendered more remarkable by his humanity. Being recalled, on the approach of evening, from the position which he occupied at Stoudzianos, he took upon himself to disobey his orders, and remained there during the whole night, for the purpose of giving every assistance to the remnants of the French army, which had not yet effected the passage of the river. At daybreak, he skilfully managed to evacuate this position, without loss of either baggage or artillery, taking with him the wounded and a large number of camp followers, who, without his humane aid, must have fallen into the hands of the pursuing enemy.

The following year, Marshal Victor commanded the second division of Napoleon's army: to the conduct of that division at the battle of Dresden (August 26, 1813) the French there obtained has generally been attributed. With the same division he likewise greatly distinguished himself at the battles of Wachau (October 16, 1813), Leipzig (October 19, 1813), and Hanau. The occupation of the Rhine had been effected by the French army, Marshal Victor was actively employed in putting in an efficient state of defence the strong places of Aixme and the Bruche Comté; he also for a time served as chief of the division of the Russian army into France. Compelled at length to fall back upon the Meuse, he effected this movement with his usual skill. He afterwards rejoined the allies in the position they had taken up at St. Dizier (January 27, 1814), and drove them out at the point of the bayonet from the village of Brienne. During the whole campaign he zealously endeavored the efforts of Napoleon and the French army in checking the advance of the allies. On the 9th of February he marched his troops towards the Seine, for the purpose of more effectually co-operating with the movements of his chief, and sustained his high character as a soldier in the defence of the bridge of Nogent (February 11, 1814) and in the actions of Nangis (February 17) and Villeneuve-le-Rol. His failure in dislodging the allies from Montereau, where he had the misfortune to lose his son-in-law, was more than counterbalanced by the displeasure of the emperor, who deprived him of his command. The marshal, it is said, refused to leave the service, and observed with emotion to his chief, that 'he had once been a private soldier, and to be made a marshal was his ambition, and would again take his place in the ranks.' The emperor, moved by this proof of his fidelity, put him at the head of two brigades of his guard, with which he distinguished himself; a few days after the treaty of Chaumont, he was severely wounded, and was obliged to retire from the field.
When the success of the allies and the abdication of Napoleon had replaced the Bourbon dynasty on the throne, he was among the first to offer them his allegiance, and was accordingly appointed 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 new government in terms which reflect high discredit upon his character; he describes himself as 'the man who has tyrannized, desolated, and betrayed France during twelve years,' and he urges every Frenchman to pursue the unsuccessful tyrant, but 'his 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 been at the head of the most compact of these satellites. The latter part of this year followed the examples of Marshals Berthier [Berthier, P. C.] and Marmont in accompanying Louis XVIII., to Ghent. [Louix XVIII., P. C.] On the second restoration, he was created peer of France, and appointed one of the four major-generals of the royal guard. He was also unfortunately conspicuous as the president of the commission charged to inquire into the conduct of his former brethren in arms during the hundred days [Next, Marshals, 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 sixteenth military division in France. In 1819, he was named Louis XVIII., minister of the war department; in this capacity he altogether disappointed the expectations to which his military talents had given rise; he alienated the affections of the people, and was described as 'a bloodthirsty old man,' and lost the little popularity he had hitherto enjoyed. He actively promoted the expedition to Spain of 1823 [Steicher, P. C. S.], and, having retired from the ministry, accompanied the army as a spectator in the campaign to the Duke of Angouleme. After the revolution of 1830, [Charles X., P. C. S.] he ceased to take any active part in public affairs; though he gave in 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 to have been actuated by the very great remark made concerning him by Napoleon, which O'Meara records: 'Victor était une lèbe sans talons et sans tête.' ('Napoleon in Exile,' vol. i. p. 511.) Such a judgment probabljly arose from the influence of the feelings which Victor's conduct, on his return from Elba, had excited. It is indeed scarcely possible that it was the real estimation 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.

(Continued...
Cupid flying from Slavery; a Woman selling Cupids; and a young Greek Girl comparing her Bosom with a Rose-bud.

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come to demand your assistance and the junction of your forces to ours, without which we can never expect to re-conquer Jerusalem; and, as we are resolved to undertake this conquest, we have been commanded not to leave your city till we have received a free answer to our message, by which you are to impose the conditions on which it is to be granted.

To this energetic appeal were joined the tears and entreaties of the other deputies, who, in the holiness of their mission, did not forget the shame of submission to the representatives of commercial power Moved by their appeal, and by the pecuniary advantages which were likely to result from the transaction, an unanimous declaration arose from the assembly of the <Nouns> favourable to our design. We were at length concluded with the French deputies and the Republic, by which it was agreed, that the Venetians should furnish the vessels necessary for the transport of 4500 horsemen and 9000 squires and attendants, and also 20,000 foot soldiers, with nine months' provisions; that the vessels should be equipped and ready to sail in the month of June in the following year, and that their service should only count from the time that they left Venice. For these services the crusaders were to pay the Venetians the sum of 80,000 marks of silver, or, according to some accounts, 85,000. The payment of so exorbitant a sum, for a period that prolonged the generous zeal of the crusaders and the attentive regard of the Venetians to their interests. After the conclusion of this treaty, Villehardouin returned to France, where he found the Count Thibault dangerously ill. The death of this noble warrior caused the crusaders without a chief. The command of the expedition having been offered to the Duke of Burgundy, and afterwards to the Count of Bar, who both declined it, it was finally assumed by Count Villehardouin, who appointed Venice as the place of general meeting.

The first exploit of the crusaders, after leaving Venice, was, at the solicitation of Alexis Comnenus, to re-establish on the throne of Constantinople, the Emperor Lascaris. The French having afterwards to complain of the conduct of Alexis, who had not ratified the stipulated conditions for the succour they had lent him, sent Villehardouin as their deputy to make the necessary remonstrances.

Villehardouin was present at the siege of Constantinople in 1204, when that city was taken by the Venetians and French [Constantinople, P.C.], and to him history is indebted for a minute and graphic description of this remarkable siege. He thus describes the impression which the first appearance of the imperial city made upon his rude companions in arms:—"That such a city could be in the world they had never conceived, and they were never weary of staring at the high walls and towers with which it was entirely encompassed, the rich palaces and lofty churches, of which there were so many that no one could have believed it, if he had not seen with his eyes the cities in that country, and know that there was not so bold a heart there that it did not feel some terror at the strength of Constantinople." Chap. 95. (See the notes at the end of xxiv. of the Waverley Novels, Edinburgh, 1827.)

The services of Villehardouin were rewarded by the Emperor Baldwin, whom the victorious Franks had placed on the throne, by his appointment to the important office of Marchal of the province of Romania. His military skill and bravery also insured him the esteem of the Emperor Henry, the successor of Baldwin, to whom the Marquis of Montmort had given his daughter in marriage; from him he received, as a free gift, the entire city of Messina, together with its dependencies. This valuable donation induced him to reside in Thessaly, where he died about the year 1213. While however enjoying the honours which his merit had acquired for him, he did not forget the interests of the country of his birth; in 1207, he richly endowed the abbeys of Fossoy and Troyes, to which his sisters and his two daughters belonged. The lavish of his name gave powerful influence to himself and his family. These two centuries ruled over the most important principalities of Greece.

It is chiefly as a historian that the name of Geoffroy De Villehardouin has become celebrated. To him we are principally indebted for the important facts of our periods in the wars of the crusades [Crusades, P.C.], from 1188 to 1207. His work is entitled 'L'Histoire de la Prise de Constantinople par les Francais et les Venitiens.' The author relates the events with a style which has given him just praise for his modest simplicity and tolerable candour. His narration is remarkable for brevity and clearness, and generally bears the impress of truth. His talents as a negotiator caused him frequently to be employed on missions of importance, and to be
ammonished 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 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 1613, and Paris in 1586; but the most valuable is that which

by the learned Du Cange, "whose notes," says Mills, "are as valuable as his notes on the Alexiad." [BRITISH HISTORIANS. P. C.]

The title of this edition of Du Cange, which has not easily been noticed, is as follows:

"Histoire de l'Empire de Constantinople, divisées en deux parties, &c., écrite par Geoffroy De Ville-Hardouin, avec la suite de cette Histoire jusqu'en 1524, tirè du Manuscrif de Philibert de Chastillon, le tout par des observations faites par Charles du Fresne, 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, 1823, in fol.: the text in this edition has been revised on three manuscripts, and it is appended a glossary.

(Vincent. De Paul, Saint.)

VINCENT DE PAUL, SAINT, was born on the 24th April, 1581, at Bananques in the province of Pouey, near the Pyrenees, in the present department of the Landes. He was the third son of Guillaume de Paul, who owned and cultivated a small estate, which was afterwards the means of his family's future prosperity. He was promised 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 at 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, 1606, 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 pittance which was allowed him, to combine the duties of a teacher with those of a student. At the year 1609, after he had received a liberal endowment, he was made a priest by the Bishop of Perigueux: in the same year he was made the parish priest of Tilh, one of the most valuable in the diocese of Agen, which he visited twice a year 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, which he was permitted to lecture on. 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 to sea, when he was taken prisoner by some Tunisian corsairs, and was wounded in the conflict. He had left 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, and nephew to his former master, was induced to his deliverance after a delay of ten months, when he was sufficiently fortunate to induce his master to forego the temporal advantages of a residence in a land where he was obliged to conceal his profession of Christianity, and to escape with him to France. There he remained until in the course of the year 1609, when he took leave of the confreres of the Diocese of the pope, Paul V., who had performed this ceremony. He induced Vincent and his companion to accompany him to Rome. He there became acquainted with the ambassador of the pope, who selected him 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 the Hôpital de la Charite, and of his frequent visits to the prisons.

The period of Vincent's residence in Paris was emblazoned by an accusation of robbery made against him by a fellow-lodger, a native of the same province as himself, and for six months he was confined in the house of correction. Man of his time, though suffering severely from the cruel imputation, he contented himself, when questioned concerning it, with a simple denial, joined to the remark that 'God knew the truth.' During the first part of this confinement, he was removed, and the reputation of Vincent rose still higher in the estimation of those who had witnessed the patience and resignation which he had displayed under the false accusation. His short residence in Paris was followed by one of as active service, and the support of several influential personages, whose friendship and esteem his merit had conciliated. Among them was Marguerite de Valois, 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 care of the parish of Cligny in the neighbourhood 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, the poor assisted, and the afflicted consoled, but family discord and dissensions and religious matters were made by his piety influence to cease.

In 1613, he was obliged to abandon this peaceful scene of spirituality, and to undertake the education of the three sons of Philippe Emmanuel de Guise. The task was one of the 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 Rennes; another, the famous cardinal, who acted so conspicuous a part in the civil wars of the Fronde. [Renz, P. C.]

In 1616, he accompanied the Comte de Joigny to her country residence at Folloure, in 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 piety gratitude. The following year, he left the residence of the Comte de Joigny to undertake the care of the parish of Châtillon, in Bresse, where his labours were attended with similar success. It was there that he first 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 he afterwards extended to 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 Count, a lady of pious disposition, and who was the more important to Vincent, under his spiritual direction, he undertook several successful missions in the dioceses of Beauvais, Soissons, and Sens. An opportunity was now afforded to labour in a cause still more noble and extensive, and which presented the most danger, disappointment, and difficulty. He was in the habit of accompanying the Comte de Joigny, whose situation as commander of the royal galleys rendered it necessary for him frequently to visit that city. He was there more occupied 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 was 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 only food: disfigured by filth, and covered with vermin, they were there deprived of the means of personal comfort and relief. In their most ignominious position, he would visit them, and, by the rude scoffs and jests to which he was at first exposed, and undismayed by the harrows of a pestilential disease, which was the prevailing evil of the period, he unswervingly pursued his charitable mission; his kindly words were anotice to their wants, his reproves, tempered by mildness in Christian charity, and, above all, his own example of humility and self-sacrifice, which convinced his hearers of the great and increasing gaining his confidence, and thus secured a ready acquiescence in his efforts for their welfare. In a short time, the most unexpected
success attended the improvements which he introduced and the reformation which he effects. The augmented condition of these criminals was sensibly felt and gratitude acknowledged by his patron, who called the attention of the King, Louis XIV, to the means and abilities of his protégés of criminals under his care and to the devoted man by whom it had been produced, and the king, with appropriate consideration for the services he had rendered, appointed Vincent almost immediately to a position of the highest importance. This appointment to an office of the Order of the Visitation, which he had lately established.

In 1628, Vincent established two congregations of clarisses in the town of Dijon, 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 confined 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 would prosper, and thus cleared them of every suspicion they might have formed of obtaining property at his death.

This resolution however did not prevent him, on a subsequent occasion, from distributing among them about a hundred pounds of money, which had been given to him for another purpose. The next scene of Vincent's labours was the town of Chartres, where he founded an association under the name of the Congregation of Lazarists, a branch of which was established in the provinces of France with efficient teachers of religion, who were to act as instructors to the regular clergy, and to be subordinate to the authorities of the church. On 6th March, 1624, the Collège des Bon Enfants was given to him 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 Joigny, and retired to college. In 1627, he had the highest credit and the most important regulations 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 abuses. In 1632, he yielded to the repeated requests of the Prior of St. Lazarus, 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, it lived to see the orders of Lazarus and the Lazarists become the most illustrious branch of the society and the most productive of charitable institutions in the greater part of Europe. The institution however which has probably been the most beneficent consequences that was the establishment in 1634; it was composed of a considerable number of men who were educated, 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, la Bicêtre, la Salpêtrière, and les Enfants Trouvés, or Foundling Hospital. [Paris, P. C.; Foundling Hospital, P. C.] The origin of this last-mentioned institution exhibits a striking proof of the disinterested zeal of Vincent. Previous to the establishment of the Foundling Hospital, in 1626, the infant children were put to the misery of the streets and public places of the city, and often left there to perish. The pitiable condition of these innocent children excited the compassion of Vincent, and often stimulated the charitable zeal of this devoted minister of the church. For the purpose of affording them food and succour he enlisted in his cause several ladies of the capital, over whose finding of a sufficient sum for the support of the poor children, he called them together at the commencement of the year 1640, and so energetically set before them the motives for their charitable intervention in the cause of these unfortunate beings, that some of the most devoted amongst them, and some of the ablest were about to abandon their charitable enterprise. To avert so unhappy an issue to his charitable project, in 1648, Vincent called together another and more numerous assembly. He there summoned to their aid a number of the first men of the city, and urged in support of his cause, and pleaded the interest of these innocent outcasts of society in a language of fervent and impassioned eloquence; an eloquence unaided indeed by the arts of a polished tongue, but which, by the irresistible force of 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 pieces of eloquence in any language. [Mauri, Essai sur l’Eloquence de Vincent de Paul, P. C.] 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 for labour; the other, the Sainte Trinite, in the diocese of Avignon, in Burgundy, was for the support of the poor over the number of 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 destined for the permanent relief of his fellow-creatures, he was no less zealous and persevering in attending to the immediate wants of those who came within the reach of his assistance. The province of Lorraine was, during the latter period of the reign of Louis XIII., suffering under the threefold calamity of war, pestilence, and famine. To this province, by his charitable exertions, for several successive years, Vincent caused considerable sums 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. [Jansénistes, P. C.; Port Royal, P. C.] Through his influence, a letter was obtained from the Pope, recommending the reigning pontiff, praying him authoritatively to condemn the witness of Jansenius, and in particular the work entitled Auguries. In carrying on this controversy however, he never concealed the fact that he had been employed against his adversaries only the legitimate weapons of argument and ex postulation. 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 sufficiently 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 nobility of the land, who as a mark of respect and esteem of their spiritual father; but perhaps the tears of most genuine affection were shed on his tomb by the multitude of the poor and needy, who gratefully remembered that they had been long consoled by his counsels and relieved by his charity. The panegyric of this eminent minister of the church has been written by two of its most distinguished prelates, Father Louis de la Balue, Bishop of Tarn, and Father Louis de Saulx, Bishop of Grenoble, and has been the subject of the highest eulogium and commendation. The 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 last edition of his Essai sur l’Eloquence de la Chaire, xxxvi, p. 321; by Pierre Mauri, P. C.; and in his death was consoled by a ceremony, known in the church of Rome by the name of Beatification, by Benedict XIII., on 14th August, 1739, and he was canonized as a saint on 16th June,
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, not only as the creator of a new scene of alleviate poverty and suffering, poverty and crime, and his presence was always attended by conciliation and relief to their victims. Men of all creeds and persuasions have rendered homage to his worth, and he is held in the highest esteem by his own church, which knoeks to the people of St. Vincent de Paul for the power of working miracles. The greatest miracle however himself, and the mighty works of which he was the instrument; the many hospitals which he founded, the reformation of the order by which he established the missionamines whom he sent abroad, the vast sum 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 lime of this apostolical man.

The following is a list of the writings he has left:—I. *Regulae sunt Constituenses concumae Congregatio Missionum*, Paris, 1858; 2. *'Le Utte au Pape Alexandre VII.*, pour solliciter la Canonisation de Francois de Sales, prince-episcop de Geneve; 3. *Conferences spirituelles pour l'obtention des Regnes des Seurs de la Charite; Paris, 1829, 2 vols.

The two most important biographies of St. Vincent de Paul are those of Abelly, who was intimately acquainted with the saint, and of Collet, who was a member of his community; there is also a third, by M. de Cospedepo, Paris, 1827, in 8vo.


*Vincularia*. A species of fossil Zeophyte is referred to this genus of Deformye from Fortlock, from the carboniferous limestone of Ireland.

Viner, Charles, died June 5, 1756, at his house, Aldershot, 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 Vinerian Professorship of Common Law in the University of Oxford. The *Abridgment* was written in his own house, at Oxford. The whole work 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 preparation. 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 Comyn, James Sedgwick, Henry Alonson, John Wyatt, James Humphries, Alexander Anstruther, and Michael Nolan.

Viner having resolved to dedicate the bulk of his property, as well as the benefits of his profession to the public service of his country,' bequeathed by his will, dated December 29, 1755, about 12,000£ 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 read a lecture in the English language within a year after his admission to the fellowship and scholarship of the university, and the volume of his lectures is to be published, and is to be inserted in the scholar, and the volume of every year in full course. The term is to consist of at least twenty-four lectures, to be read in one and the same term, with such intervals that not more than four are to be read in a week, and the reading of the whole course of twenty-four years is reckoned as one term. There are at present (1846) two Fellowships with 50l. a year each, and five Scholarships with 50l. a year each. Both Fellowships and Scholarships expire at the end of ten years after each election.

Blackstone was elected the first Vinerian Professor. He had commenced his lectures on English law in the year 1756, and continued them two years, and in the latter part of his course he felt that Blackstone's lectures gave him the hint for the foundation of the Professorship. The succession of professors is as follows:—1756, William Blackstone, D.C.L.; 1790, Richard Viner, D.C.L., 2. *Lectures on the Law of England*, 3 vols. 12mo., 1753, 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.*

*Biolinn Strings.* [Catulle, P.C.S.]

*Vita.* (In honour of M. de Visme, a Lieben merchant), a genus of plants belonging to the natural order Hypericaceae. The calyx is five-parted, usually villous on the inside. The berry membranous, the styles 5, stigmata 5. The stamens are numerous, disposed into 5 bundles opposite the petals, alternating with 5 glands or scales. The anthers are small, roundish, 2-celled, bursting lengthwise, the sepal with a double covering. The leaves usually protected with a dusty down, rarely with pollen dust. *V. guianensis* is a small tree with a stem about eight feet high, the leaves ovate, lanceolate acuminate, dilated at the base, rufous beneath, smooth above, filled with transparent dots. The flower is short, the calyx tubular, the corolla with 5-cleft, villous ciliata margined. The yellow berry, ovate, soft, and somewhat 5-cleft, covered. The bark when wounded yields a gum resin, which when dry becomes hard, and resembles gamboge. The leaves and fruit likewise yield a similar acetum. It is used in medicine as a purgative, in doses of from 7 to 8 grains. A decoction of the leaves is recommended in intermittent fever. This species is native of Guiana and Bengal. There are about twenty other species growing in the East Indies, Bengal, and Guiana: those from Guiana yield a resinous gum, which finds its way into Europe under the name of American Gamboge.

*Linley. Flora Medica.*

*Viturvius Britannicus.* [Gandon, 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, Vittorino repaired to Mantua, where a separate and commodious residence was prepared for himself and his pupils. Here Vittorino formed the plan of a species of distinctiion repaired thither in succession to avail themselves of Vittorino's instruction, and among them Federico di Monte-feltro, afterwards duke of Urbino, Gicerto, prince of Correggio, Duke Alberico di Feltre, afterwards bishop of Reggio, Lodovico Torres, and Bernardino Brenzoni, who became afterwards celebrated as jurist, Theodore Gaza and George of Trebisonde, Ambrogio Traversari, or Camouledia, who visited the school of Vittorino at Mantua, giving in his Epistles (lib. vii. viii.) an interesting account of his system of education; and Carlo Ioinini, who died lately, has written a work on the same subject, entitled *'Itta dell' istoria prendente nella vita, a disciplina di Vittorino da Feltre a de' suoi discepoli.*

It appears from the example of Vittorino, of Guarino Veronese, 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 a part of Vittorino's system. He lived with his pupils and took his meals with them. Their fare was wholesome but plain. He had tabules of various colours to teach his younger pupils the rudiments of reading. His older pupils were instructed in rhetoric, mathematics, and ethics. He was very strict with regard to their morals. He watched the discipline of his students with jealous care, and showed them how to handle the club. He loved them like a father. Such was the character of this distinguished preceptor.
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, 'Calus 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 Romans: 'Liber de satyras Latinae naturae et ratione, item paraphrasis perpetae et commentarii uberrimae in X satyras Juvenalis,' Padua, 1744; he edited the poems of Sannazar, 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 1766. 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 e 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 Corradi's great work, 'Vetus Latium proficuum,' which he completed.

(Tiraboschi, Storia della Letteratura Italiana, with the continuation by Lombardi.)

VOLEZIP, a genus of fossil (coniferous?) plants which occurs in the Magnesian limestone of England, and in the new red sandstone of Germany. (Bromiart.)

VOYAGE. [Ships, P. C.; Bottomry, P. C.]

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Voyage [Ships, P. C.; Bottomry, P. C.]}
W.ROBEET, ROOBERT, 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, Gasso, Gauze, Guxo, and Hulstace, names which appear to be abbreviations of Eustache or his race. 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 prebend, according to the ancient capitularies of that church, he held from 1161 to 1171. As he frequently styles himself 'cleric liant,' reading clerk, it has been supposed that he was attached to the private chapel of Henry II. He is, however, and that that was bitterly, that the reward he received from the Dukes of Normandy neither answered his anticipations nor came up to the promises they bad 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.'

"Lange est la geste des Normans, / A sa source est grave ou Roman. / Si l'on demande qui se fit ? / Kei! ce sont les vers qui sont subtils. / Julj de faute, ke j'ont, / Wace, de l'isle de Grece, / Kei est en mer vers accident. / Al fow del Normandy appele ? / En forme de langue il ne. / A Caen fu-tu les paroles, / Hancet fu-tu en brises mites, / Poit du langue en France apres, / Quand de France je repartis. / A Caen haisse conversal ? / D'Amiens a livre de Normamy. / Musi qui en scire et mult en fie. / Per Cet en s'ar et fer Rel. / Auvers: en fis si servir se de. / Me foi devant, Das en sentences. / A Rahims use enm present. / Hert prepare vos die. / Neun Hesit, per Hesit."

The rhymed chronicle from which this extract is taken is entitled 'Le Roman du Rou (Rollo) et des Ducs de Normandy,' and is the best known of the writings of Wace; it is held in high esteem as a monument of the language and as a historical document, which, though incorrect in some of its details and sometimes inexact in its data, presents a faithful picture of society during that period. It contains the history of the Dukes of Normandy from the first invasion by Rollo down to the eighth year of King Henry I., and not simply, as Hallam states, the narrative of the battle of Hastings and conquest of England by the Normans. The first, or introductory part, is 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 Alexandrine verse, 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 alone longer than the three preceding, he describes the exploits of William the Conqueror, presents us with the sequel of the history of Richard, and that of his successors to the year 1106. [NORMANDY, P. C.] The whole poem contains exactly 15,547 lines. He generally follows Dudo and William of Jumièges in his choice of his sources. The translation is:

"Longue est la geste des Normans, / A sa source est grave ou Roman. / Si l'on demande qui se fit ? / Kei! ce sont les vers qui sont subtils. / Julj de faute, ke j'ont, / Wace, de l'isle de Grece, / Kei est en mer vers accident. / Al fow del Normandy appele ? / En forme de langue il ne. / A Caen fu-tu les paroles, / Hancet fu-tu en brises mites, / Poit du langue en France apres, / Quand de France je repartis. / A Caen haisse conversal ? / D'Amiens a livre de Normamy. / Musi qui en scire et mult en fie. / Per Cet en s'ar et fer Rel. / Auvers: en fis si servir se de. / Me foi devant, Das en sentences. / A Rahims use enm present. / Hert prepare vos die. / Neun Hesit, per Hesit."

riv fixed facts, but he adds many interesting and curious details which are of considerable importance and which are not usually included in other histories. His description of the battle of Hastings [WILLIAM L. P. C.] is given with considerable minuteness of detail, and has been largely drawn upon by succeeding historians. Among the most noticeable features of the English labourers' song, 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 two extant 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:

"Le Brut d'Angleterre, / A work which preceded his 'Roman du Rou.'"

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 Brutus, who is imagined to have been the great grandson of Zeus, 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. [ARTZIB, P. C.]

The next authentic work of Wace is styled 'La Chronique accomplie des Ducs de Normandy.' 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 'Mémoires de la Société 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 extant poems of Wace are three—1. 'Les Chevalier du Lion,' 2. 'Le Roman du Rouen,' and 3. '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 the works of Wace.

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. 7567, and at the library of the Royal Arsenal; a few volumes, of the Royal Library in London, have been written in the fourteenth century. The most antient 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 Bresquigny, in the fifth volume of his 'Notices des MSS. de la Bibliothèque Royale.'

In 1827, there was published at Rouen a 'Le Roman du Roi 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 the works of Wace.

The following works may be consulted for a more ample account of the life and writings of Wace:—1. Capetigue, 'Essai sur les Invasions Maritimes des Normands dans les Genêts,' 1828; 2. Depeup, 'Histoire des Expeditions Maritime des Normands,' 1826; 3. Wheaton, 'History of the Normen,' London, 1831. In these two works there are copious and interesting extracts from the 'Roman du Rou.' Depeup particularly has very justly appreciated the value of Wace as a poet and an historian. 4. Pluquet, 'Notice sur la Vie et les Ecris de Robert Wace, suivie de Citations extraits de ses Ouvrages,' Rouen, 1844. In this work will be
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 purposes of raising water, grinding corn, and various other operations for which a moving power is required. It is probable that a wheel was in general use in Egypt, in the East, in a very early age, to raise water; for Moses reminds the posterity of Israel (Deuteronomy xi. 10), that in Egypt they served their seed and watered it with the foot. A garden of herbs was made in China, and raised a plant for raising water to the higher grounds on which rice is grown. In a treatise on machines, which was published at Nurnberg in 1601, there is a description of a revolving wheel which was used in the construction 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 upon a horizontal fire-place, and at its upper extremity, in 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 hands against horizontal rill and with their feet against slips 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 cog 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 employed with France has a kind of walking wheel rendered invariable 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 would be constructed of an oval and a place on it, to put his power in equilibrium with different degrees of resistance; thus, when the resistance is great, he may walk near the circumference of the wheel, and when the weight of the man or the small, he may find a place more towards the centre at which he may 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) is 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 hollow cylinders or drums, the horizontal rim of which that blows with little interruption throughout the winter and spring down the valley of the Oxus, is unfavourable to vegetation. Their fleek of sheep and goats constitute the wealth of the country, and which are kept for other purposes, such as shawls of Cashmire are made. The horses are small, but strong. Of quadrupeds, wolves, foxes, and hares are mentioned. There is also a kind of wild sheep called Kutch-har, which is of the size of a two-year-old colt, and has splendid curled horns; in autumn, when this animal is in prime condition, no venison is better flavoured. It lives in hordes of several hundreds. The skin resembles the hide of a cow with the fleece of a sheep. There is still another animal found in the adjacent mountains called Russ, which is described as being larger than a cow and smaller than a horse, and has immense horns; it appears to be rare. The population of the valleys depends largely upon the increase of their flocks; in the statement of Lieut. Wood. The Wakhan boas being descended from Hazrat Zekonder, or Alexander the Great, but Lieut. Wood did not discover any difference between them and the cheetahs in the plains of Turun, whose language they also speak. The chief of Wakhan is dependent on the sovereign of Kunduz; but this dependence appears only to be nominal, except that he sends an annual present to the Amir, and has the right of fishing in the lake, which leads eastward to the town of Yarkand, in Chinese Turkestan, and westward to Kunduz and Balkh, and thence to Bukhara, Kabul, and Candahar. The chief of Wakhan (Wakhem; Wood, Journey to the Source of the River Oxus). WALCHIA, a genus of Lycopoidea fossil plants from the coal and oolite formations. (Bremberg.)
Wallace, William, a mathematician of considerable eminence, was born September 28th, 1768, at Dysart, in Fifeshire, N.B., in which town his father, a manufacturer of leather, lodged. He received the rudiments of education at a dame's school in his native town, and, at seven years of age, he was sent to a school in which, under a master, he acquired the power of writing, but to his father he was indebted for instruction in arithmetic. In 1784 his father, after the failure of his business at Dysart, having gone with his family to reside at Edinburgh, he was placed with a bookbinder in that city, to whom soon afterwards he was bound as an apprentice, but he failed to continue it, and, though he continued to have the benefit of his father's moral superintendence, as well as advice and assistance in the prosecution of his studies. Without any encouragement from his master the youth derived some advantage from the opportunities which he occasionally presented himself of perusing the books which he was employed to bind; and having, besides, found means to purchase some mathematical works, he succeeded in making himself master of their contents. It is said that before he was twenty years of age he had acquired a knowledge of elementary geometry and trigonometry, algebra with fluxions, conic sections, and astronomy.

About the age of five he became acquainted with a man who was employed by Dr. Robison as an assistant in making the experiments by which the subjects of his lectures were exemplified; and, when the term of his apprenticeship expired, he seemed naturally to find a place in the society of the distinguished professor. Dr. Robison finding, after an examination, that the young man had attained to considerable proficiency in mathematical science, and being made acquainted with his humble condition in life, kindly permitted him to attend the course of lectures on Natural Philosophy which was then about to commence. Of this permission he thankfully availed himself, and he regularly attended the class, though, in order to be enabled to do so, he was obliged to labour in his vocation during a portion of the time which should have been given to repose. Dr. Robison soon afterwards proposed to him to give lessons in geometry to one of his own pupils, a young man engaged in his business, and he, taking an interest in his welfare, contributed both by advice and by loans of books to facilitate his progress in acquiring a knowledge of the higher branches of mathematics. For some time the prosecution of his studies, Wallace quitted the calling for exercising which he had qualified himself by serving an apprenticeship, and became a warehouseman in a printing-office; while engaged in which business he acquired, with the assistance of a fellow student in the university, a knowledge of Latin; and soon afterwards he began the study of the French language. He subsequently became a bookseller in one of the principal book-sellers of Edinburgh, and while holding that station he gave lessons occasionally in the evenings in mathematics.

In 1793 his increasing love for science, and a desire to have greater opportunities of cultivating it, led him to resign his employment in the city, which he had already been induced to do. He was appointed as mathematical assistant to the, so-called, Volunteer Artillery, of which he was appointed captain, and the mathematical exercises of his regiment were held at Perth. He married soon afterwards, and during the vacations he regularly visited Edinburgh, where his talents procured him an introduction to the distinguished scientific men of that city.

Mr. Wallace continued to fulfil the duties of his appointment at Perth during nine years; but in 1803 he was invited to offer himself as a candidate for the post of a mathematical master in the city of Edinburgh. The post of mathematical master had then been established, and the prizes for the purpose the plan of a small observatory was furnished by Dr. Robinson, of Oxford; and Mr. Wallace, who was appointed to deliver the lectures there, attended the detail of the construction. Such instruments were provided as sufficed for the object proposed; and it may be said that the establishment of a course of astronomy at the college has contributed materially to the efficiency of the college, and has been a powerful agency in the defeat of the opposition of the university of Edinburgh.

In the following year the death of Professor Playfair and the appointment of Mr. (Sir John) Leslie to succeed him in the chair of Natural Philosophy at Edinburgh, left a vacancy in the chair of Mathematics; and Mr. Wallace, whose highest ambition had always been to obtain a professorship in a Scottish university, immediately became a candidate for the post. He was elected, after a severe contest, by a majority of the votes, and he held the appointment to the last. A year later, when, on account of ill health, he resigned it. On this occasion the university conferred on him the honorary title of Doctor of Laws, and he received from government a pension in consideration of his attainments in science, as well as of his services in the Military College and at the University of Edinburgh.

Mr. Wallace died at Edinburgh, respected and regretted, on the 29th of April, 1843, and consequently in the 75th year of his age, after an illness which for several years had prevented him from entering into society. He had been a Fellow of the Royal Astronomical Society from the time of its formation; he was a Fellow of the Royal Society of Edinburgh; a corresponding member of the Institution of Civil Engineers; an honorary member of the Cambridge Philosophical Society; and, a few weeks before his death, he was elected an honorary member of the Royal Institution of Great Britain. In 1786 he presented to the Royal Society of Edinburgh his first paper, which was entitled *Geometrical Porisms, with Examples of their Applications to the Solution of Problems*; it contains some new and peremptory propositions, investigated according to the method of the ancient geometers, and affords proof of considerable inventive power. About the same time he contributed the article *Porism* to the third edition of the *Encyclopedia Britannica*.

In 1805 he presented to the Royal Society of Edinburgh a paper containing a new method of expressing the co-efficients in the development of the formula which represents the rectification of an ellipse. He had observed that when the time at which he gave to the ellipse a new curved line, and apparently Mr. Wallace had not seen them. Six years afterwards he presented to the same society a third paper, entitled *New Series for the Quadrature of the Conic Sections, and the Calculation of the Logarithms of a Number*. The remarkable formula for the rectification of circular arcs and the. sectors of equilateral hyperbolae, and for computing logarithms. In 1828 he presented a paper on the *Investigation of Formulae for the Logarithms of Two Numbers, which lies from one another*, and in 1831 one entitled *Account of the Invention of the Pantograph, and A Description of the
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 commis-
sion appointing him the Commander-in-Chief of the English squadron. The
first object of the expedition 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. This service was performed by Admiral
Wason on the 17th of December, 1756, to the joy and gratification of the wives and children of this prince, who had become his
prisoner, was marked by the most courteous humanity. In the
attack made by Colonel Clive on Chandernagore, a place of
great strength, and very rich in treasure, he was so
awarded the small fleet of only three ships of the line destined to
co-operate with the land-forces. 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 force
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 he may be said to have
ended his admiral's short but successful career; on the 16th of August
1757, he fell a victim to that unhonorable climate. His
death was severely felt by his companions in arms, by whom he was
adored. He had been for several years in the service of
the East India Company, and during the passage of the
successive modifications of the kingdom, and in the displacement
of the habitants, he had been very active. He had
received the title of Baronet, in 1763, is
Water PLANTAIN. [A1smaze, P. C.]
WATSON, CHARLES, VICE-ADMIRAL, was born in
the year 1714, and was the son of the Rev. Dr. Watson,
Princedale, Paras, in the county of Lanca-
ter. His military education was begun at an early age,
but not nine years of age enabled him to follow the inclination
he had already manifested of entering the naval pro-
fession. His skill and bravery soon procured him promotion;
and in February, 1738, he was commissioned captain of the Garland
frigate, and, in 1744, he was transferred to the Dragon of 60 guns,
under Admiral Matthews, on the Mediterranean station.
In that command his services were required on several
important occasions, and were most successfully attended with success.
He was afterwards sent by his admiral to Cadiz, with orders
to cruize off that harbour for a certain time, afterwards to pro-
ced to Lisbon, and from thence to England. After the
expiration of those orders he proceeded to Cadiz to inspect the making of many rich prizes,
he ventured to disobey them on receiving intelligence that
the enemy's fleet was preparing for sea at Toulon; and,
according to a commission from the 3rd of March, 1763,
gg, under Admiral Matthews, on the Mediterranean station.
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WAX 704

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 even in the earliest periods of modelling, but that the process was not yet confined to wax 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.

In doing the same work at different ages give various directions for the preparation of the wax to be used. Vasari, who doth not mention that he used in his own time, recommends the admixture of a little tallow, turpentine, and pitch, with the common yellow ochre of varying quantities. The tallow renders it more soluble and fluid, the turpentine more adhesive, and the pitch colours it, and assists it in hardening after the operation is complete: it may also be coloured with a little red ochre in powder, which must be mixed with the wax in its liquid state. It may be made of colour in the same way. A French mixture is—to one hundred pounds of yellow wax, ten pounds of turpentine, ten of pitch, and ten of hops. Card, 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. Fichet, in his 'Art du Moulager en Plâtre,' of which there is an abstract in Panekoucke's 'Encyclopédie Méthodique,' gives the following formula for founder's wax—to four of wax, mix one of tallow, and a little pitch together. The admixture of these which when melted together are fluid and manageable. This will probably be the composition used by J. B. Keller and Girardon in preparing the mould for Girardon's equestrian statue of Louis XIV. In all cases it is now preferred, as wax is a compound material and can be cut to the shape required. Several other mixtures are and are 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. We may now proceed to describe the methods of its application.

André Verrochio, a celebrated sculptor of the fifteenth century [VERROCHIO, P. C.], is said by Vasari to have been one of the first among the moderns to introduce whitewax which would be taken from life, or, in Vasari's words, to bring the practice into general use—"ele fu do' primo e beniscisse a metterlo in uso" (ed. 1568). 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 Verrocchio has remarked, must have been taken when Verrochio 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 than probable that plaster casts were made also. The first distinct use of chamber casts in modern times was Andrea Pisano [PISANO, P. C. P. S., p. 426], who modelled the gates of the Battistero of St. John at Florence, which were cast by some Venetian founders in 1350. These gates were previously known as the equestrian statue 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 completed until so late a period is absurd. Verrocchio is quite untenable. The fact of bringing casts from Venice to cast the gates of the Battistero of St. John does not so much show that Florence was without good metal-founders, as that Venice had obtained reputation of its art, sufficient to give rise to the opinion 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 a form of casting only the end of an art that its whole process in its process is of quite a different character from the modelling of works of imaginative art. However, at whatever period and by whatever process the early Italians first prepared their moulds, it is evident that they used wax, and that the most probable consequence used-wax in the preparation of the model for the casting. The antiquity of the Greek and Romans also probably used wax for the same purposes. There are few ancient monuments which do not contain portions of casts, and the survival of them is the equestrian statue of Marcus Aurelius before the Capitol at Rome. This monument is hollow, and was cast in two parts and probably the ancient method was not very different from that described by Vasari; some ancient works were cast solid. The Greek and Romans also probably used wax in casting statues of objects in fact the Greeks and Romans were more or less familiar with almost every method and concomitance known to the modern sculptor. Müller, 'Handbuch der Archäologie der Kunst,' Messmer, 'Technik der Kunst.'

It is generally allowed that the method of casting in modern times was Girardon's colossal statue of Louis XIV, cast by J. B. Keller in the Place Vendôme at Paris until 1752. After Girardon had completed it the monument was destroyed by the French and replaced by the present one. The monument is said to have been 66,000 lbs. and, its height, including the bronze pedestal, 21 feet. This enormous mass of metal required to be cast. The preparation 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 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 mould was then placed, with a certain amount of clay 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 piece carefully smoothed; the next end of the mould was then 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 now a hollow shell, with a thick coating of wax all over it. The interior, the whole being kept together by iron supports, inside and outside. The next step is to fill this hollow shell, through an aperture left at the top, with a composition of plaster and sand, which is allowed to harden. The plaster body is termed in English a core (in some books written corps), by the French modigli, by the Germans kern, and with some writers the oima. 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, and sometimes very fine ashes. This composition, used 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 covered with the finer plaster: each coat is allowed to dry before the next is put on. The plaster is then carefully dried and be gradually made of a corner mixture. When this new shell or mould is of a sufficient thickness and is properly strengthened by iron bars, a coal fire must be kindled round it and be kept burning until the whole of the wax is burnt out, proper vents being made for its escape. This burning out of the wax is a very tedious and difficult process, lasting sometimes as much as four or even six weeks. (Stilt, Elisenda in Attacchi, Stiglmayr, p. 484.) Vasari, in his 'Introduzione,' e. xii., says the only way of knowing whether the wax is all out is to carefully weigh the quantity of wax that you put in the first place upon the mould, and then to weigh what you get out. 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 uninteresting process of coating the wax. If the quantity of metal required to be melted was accurately ascertained. The great difficulty and long process of melting out the wax was the cause of what is called the wax method. By giving casting metal to the clay and sand modelling as its substitute has been generally established. Until 1824 Stiglmyser used the wax method; from that time the clay method. The largest single cast by Stiglmyser does not amount to more than half the weight of this enormous cast by Keller: it is however now
When the wax is at length melted out, the mould must be strengthened by brickwork, and the whole pit must be closely filled with sand and made water-tight; the mould is then abandoned and is divided in its course into three smaller channels or ducts which lead to three openings in the now hollow mould, which is buried in the earth a little below the furnace. The wax which is poured into moulds taken from the face itself would be the mere resemblance of death, for they would be without eyes and otherwise void of expression. They were probably cast from moulds taken from models, though such masks may have been used in the construction of the models.

Pliny (xxxvi. 9), speaking of the corrupt taste which prevailed among the Romans in his own time, regrets the good old customs of their ancestors. He says, 'Now all men think more of the material in which their likenesses are made, than of the art or the resemblance. The effigies they leave behind them are rather images of their wealth than of their persons. Thus it is that noble art decays and perish. With our ancestors it was very different; their halls were not filled with either strange images of brass or of stone, but with the lively portraits of themselves and of their forefathers, in wax, exact similitudes.' From this it appears therefore that the Romans loved their ancestors not as image of themselves made, to be handed down to their posterity. Many writers notice and praise the custom. Vitarus Maximus (v. 8), alludes to the advantages of the practice by virtue of example. It is said that at a banquet, during the time of the Roman Republic, some could make them but those who had themselves or whose ancestors had borne some curule magistracy. Cicero speaks of the right of handing down your image to posterity.

The number of ancient sculptors who have been known is considerable. To these we may add the names of some of the learned antiquaries who have adorned the greatest care. And when any other person of the same family diet, they are carried also in the funeral procession, with a body added to the bust, that the representation may be just, even with regard to size. They are dressed likewise in the habits that belong to the ranks which they severally filled when they were alive. If they were consuls or praetors, in a gown bordered with purple; if censors, in a purple robe; and if they triumphed or obtained any similar honour, in a vest embroidered with gold. Thus apparelled they are drawn along in chariots preceded by the rods and axes, and other ensigns of their former dignity. And when they arrive at the place where they are to stand, of ivory; and then exhibit the noblest object that can be offered to a youthful mind warred with the love of virtue and of glory. For who can behold without emotion the forms of so many illustrious men of former living, as if they were standing together in his presence? Or what spectacle can be conceived more great and striking? The person also that is pointed to harkens, 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, recounts the fortunes and the exploits of every one in turn. By this method, which removes continually the remembrance of men celebrated for their virtue, the fame of every great and noble action becomes immortal; and the glory of these by whose services their country has been benefited is retained.

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 casting of certain monuments in marble in art in his time, and doubtless the vulgar technical language of artists would have been unintelligible to the great majority of his readers, and artists themselves probably of one part of Italy. He calls Orsino as a wax-modeller the most ingenious of those of another part: it is more than probable that Vasiari had the difficult task of inventing a great portion of his terminology: he has been followed by all subsequent writers.

It remains to treat of that department of wax-modelling termed ceralastic. Under this term is comprehendetion moulding and casting in wax, though not in the manner already described. The art of casting in wax from nature was, according to Pliny (Hist. Nat. xxxvi. 44), invented by Lyctius-tratus, of Sicyon, the brother of Lyssippus, about 300 B.C., who, he says, first of all men took plaster moulds from the face and made wax effigies of them. In his time it became eventually very common, and especially among the Romans. It is however very unlikely that the many treasured wax portraits we read of in ancient writers were made from moulds taken from their face itself; that would be the mere resemblance of death, for they would be without eyes and otherwise void of expression. They were probably cast from moulds taken from models, though such masks may have been used in the construction of the models.
...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 coarser compositions, and 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 dressers a fixed character. These figures were altogether successful, says Vasari, that they appeared to be living. One of them was placed in the church of the Monache di Chiarito, in the Via di San Gallo; another in the Servizio; and a third in the church of Santa Maria degli Angeli at Assisi. In this Servizio church were many other wax figures by Orsino, all of 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 Vivoti distinguished himself by a model on slate, in coloured wax, of Michelangelo's Last Judgment in the Sixtine Chapel. It was engraved by Ambroso Brambilla, and a particular description of it was published in Rome in 1590—'Dedicata sopra la mille milizie di di Bartolo di Meo di stucata con colori, scolpita in pietra nera, da Jacopo Vivoti.'

Two centuries after Verrocchio, and one after Vasari, this art was used usefully and with the utmost skill applied by Giacomo Giglio Zummo, and Francesco Zuccari, in 1666, in the preparations of anatomical models and pathological examples. Zummo obtained the European celebrity for his two groups of figures representing the stages of embalming and the different effects of the plague. He modelled also an anatomical head at Paris, which is described in the Mémoires of the French Academy of Sciences, of 1701, the year of his death. Zummo, P. C.

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 Erode Lelli, and the preparations were made by Giovanni Manzolino of Bologna and his wife Anna Morandi Manzolini. Manzolini died at Bologna in 1755, aged 55. 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 Ostetricia 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. (Crespil, Felicina Pittricce, where there are portraits of both the Manzolini.)

There is 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 the models are numerous and of good workmanship by various artists, but the principal contributors to its treasures were Felice Fontana and Clemente Sunini. The works of the earlier modellers in wax are set apart in a chamber by themselves; here are some of the models of Zummo, among which is one showing the whole anatomy of the human head, similar probably to the one made at Paris.

The Musée Dupuytren at Paris is celebrated for its morbid collection; 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 principal cities of Europe have now their collections, and many universities are numerous. The Museum of University College, London, contains many excellent specimens by the late Mr. William Tulas.

In this department of modelling none but the purest wax is considered, and even the most perfect work must yield the wax in the final substance of the work. Different modellers use different compositions; and some allowance must be made for hot and cold weather, as what would be well adapted for summer work may be quite ineligible for winter. It is therefore necessary that each modeller should use simply wax and a small proportion of Venetian turpentine; other wax, resin, common turpentine, and a little olive-oil; and at least two-thirds of the whole composition.

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 will commence by taking from some object the peculiar processes, imagining it to be detrimental to their interest. However, we may speak of general principles.

Nearly all wax models are cast from moulds, and the casts only then finished. But some modellers use wax as a pigment, and moulds are generally taken from the objects themselves, either in plaster of Paris or in a composition of bees'-wax, Burgundian pitch, and Venice turpentine, with a very small quantity of water, but a large quantity of oil, which may be either linseed, olive or linen-oil. These preparations, 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 cast in pieces without any danger to the cast: in taking 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 destroying the cast also; the elastic mould therefore has great advantages in such cases over the plaster mould. When only one vision of a face is to be used, 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 surface. In these cases the object must be cast in a box of soft wax, 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 moistened with a little of any absorbent substance, not oil, but most 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 perhaps counteract the principal aim of the cast. The wax-composition mould must be slightly touched with a soft hair-foil or with oil, to enable it to peel away afterwards without the slightest danger to the cast: being of a perfect smooth surface, the small quantity of oil it retains is immaterial.

When the cast is made, and what they call backed up (that is, strengthened with a coarser composition within), the process of painting commences; but all effects cannot be given by mere colour, some morbid deposits and effects require 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 represented, with fine hair-pencil, or occasionally tinted 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 most minute morbid effects are to be shown of a distinct substance from the healthy texture, different coloured wax should be used in casting the healthy and diseased portions, and the parts may be corrected by modelling. The same principle should be observed in the representation of objects 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 entirely cast, 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-pencil, receive their local tints; and are finally joined and fastened into the required figure. Insects are modelled by combining the two processes. In moulding objects with hair or delicate raised parts, a little oil must be carefully put over the parts, unless they are protected. Dry firm objects may be modelled 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 likewise are made in various ways; but the essential process is, in moulding the object, the wax is first modelled, and when this is done, the wax is then dried up and filled up, or the object be modelled. The materials may be cast in any proportion of wax with a little wax. The wax is solid, as for example, is used for objects which must be modelled as perfectly as possible, and which cannot be cut through. This method however involves a considerable waste of time and materials. A more efficient method is to make wax models and cast a mould from it. The mould is then used, and very little wax is lost. After the mould is made, it is a simple matter to cast the object. The method is most suitable for nature casts, and for objects which can be cast and modelled. It is also very suitable for objects which are to be modelled in this manner:—Let a thin block be fashioned in a mould or otherwise, of coarse paper pulp and size; when dry it must be coloured all over with flesh-tint, the local colours being put on, a higher degree than is natural, as the colours of...
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; its regularity may be secured by rubbing the corners of the wax and stringing it to run by means of a hot iron or burner (called cautery by the ancients) which must be hold near it until the whole has a uniform surface. The colour originally painted on the paper black, but the hair, the eyes, and a few local touches to finish it. Marks may be also dipped in wax, or the wax may be put on with a hair-tool, if the mask be kept warm; or a wax cast may be made, and the model slung hereon. There are however other methods of modelling wax figures, but no method can be properly explained by a verbal description; such mechanical processes must be witnessed to be understood. Modellers have made figures which would scarcely convey a sufficient notion to one wholly ignorant, and those well acquainted with the art have no need of such directions; for this reason this article has been limited to mere general principles, which is as much as the general reader can require or understand.

Many wax preparations of all kinds are of course made from more models made by the artist; and many preparations in museums, which appear to be wax, are painted plaster of Paris. Sculptors also are in the habit of making wax models of small objects in the round, or for bas-reliefs to be cast in metal. The wax used in the manufacture of the German and Dr. Webbs, the Swiss, and many American modellers use modelled clay models made of: the same wax is used as is required for casts. (Modelling, P. C. S.) Medals and small bronzes are generally modelled in wax. Impressions from seals, engravers, and maps, are taken with a powder; the wax which is prepared with a little powdered sugar-candy, turpentine, and lamp-blank, after being melted, is preserved in small cakes. These cakes when wanted are softened by repeated pressure of the fingers, and are then compressed into or upon the seals or cameos, previously wetted, from which the impressions may be required.

WEBSTER, NOAH, LL.D., was born at West Hartford, in Connecticut, U. S., 20th of October, 1758, and was descended from John Webster, who, having been one of the original emigrants from Massachusetts by whom the colony of Connecticut was founded, was afterwards governor of the state in the year 1654. Noah Webster entered Yale College in 1774; in 1777 he was withdrawn for a time from his studies by joining the military service under the command of his father, who was a captain in the Alarm List, during Burgoyne's expedition from Canada; but notwithstanding his interruption he took his degree with great distinction the following year. He was called to the bar in 1781; but, instead of following the profession of law, he engaged in that of education. He was connected with William Eliot, president of the now-celebrated institute of the English Grammar,' published at Hartford in 1783, was the first of a number of elementary works produced by him, all of which were well received and were generally adopted by the schools. His Grammar had previously possessed. He also however took a leading part in the discussion of the political questions of the time, both by his 'Sketches of American Policy,' published in 1774, and his other publications on the subjects of federalism, and by the establishment in 1789 of a daily paper in New York, which still subsists under the name of 'Commercial Advertiser and New York Spectator.' In 1798 he removed to New Haven, where he spent the remainder of his life. His great work, and that which has chiefly made his name known in this country, his 'New and complete Dictionary of the English language,' was begun in 1807, and the first edition was published in 1828. This work, which had been since several times reprinted, the last edition, we believe, being that of New Haven, 1841, in 2 vols. 4to., is a performance of great labour and care, and is perhaps more precise in its explanations than any of our other English dictionaries. Its etymological portion however is more ingenuous and scantly than really learned or profound. Dr. Webster, whose degree of LL.D. we believe bestowed upon him after the publication of his dictionary, died at New Haven on the 27th of May, 1843.

(Memoir in Gentlemen's Magazine for August 1843.)

WERNER, JOHANNES, a German mathematician and astronomer, was born in the first half of the year 1468. Nothing apparently is known of his life, except that, when he was twenty-five years of age, he went to Italy, where he made some astronomical observations; and he is said to have made a series of observations on the comet which appeared in the month of April in the year 1500; from observations which he made on the positions of Regulus, a Virgin, and a Libra, compared with those which had been assigned to the stars by Ptolemy and Albategnius, he determined the precession of the equinoxes to be 70 minutes of a degree in 100 years, a quantity much too small: and he found the obliquity of the ecliptic to be 25° 28'. In the year 1512, he published 'Annotationes in the First Book of Ptolemy's Geography,' in which he endeavoured to explain an obscure passage concerning the projection of the celestial sphere on a plane surface; and it deserves to be remarked in that in the same year the English printer, John Trevisa, published the method of determining geographical longitudes by the angular distance of the moon from some star: he recommends, for making the observation, the cross-staff or fore-staff, a rule instrument which is now commonly known by his name. In 1522 he published at Nürnberg, in 4to., his 'Opus Mathematica,' in which is contained a treat on comi:es: 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 of the planets, and planets were represented conformably to the Ptolemaic system; and was employed on 'The Movement of the English Skies.' He died in the year 1524.

HISTORIA ASTRONOMIAI, by Weidner; Histoire de l'Astronomie Moderne, by Delambre.

WESTERN PORT. [WALES, NEW SOUTH, P. C.] WETHEIRELLIA, a genus of fossil fruits from Shapley and Bowesbank.

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 was admitted kindred with Sergeant Fleetwood, the recorder of 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 was next an unsuccessful farmer; afterwards he sailed with the abortive expedition of Gilbert to Newfoundland; and, finally, returning to England, he appears to have been chiefly occupied during the remainder of his life in literary labours which he had previously practised occasionally, and now attempted with indifferent success as a means of subsistence. He is now chiefly known as having been the author of the rule play (or romance) 'Patience or the Embattled Cuckold', which had previously possessed. He also however took a leading part in the discussion of the political questions of the time, both by his 'Sketches of American Policy,' published in 1774, and his other publications on the subjects of federalism, and by the establishment in 1789 of a daily paper in New York, which still subsists under the name of the 'Commercial Advertiser and New York Spectator.' In 1798 he removed to New Haven, where he spent the remainder of his life. His great work, and that which has chiefly made his name known in this country, his 'New and complete Dictionary of the English language,' was begun in 1807, and the first edition was published in 1828. This work, which had been since several times reprinted, the last edition, we believe, being that of New Haven, 1841, in 2 vols. 4to., is a performance of great labour and care, and is perhaps more precise in its explanations than any of our other English dictionaries. Its etymological portion however is more ingenuous and scantly than really learned or profound. Dr. Webster, whose degree of LL.D. we believe bestowed upon him after the publication of his dictionary, died at New Haven on the 27th of May, 1843.
and Practical, the 708 the clerical
in the last-mentioned year he set up a second Spanish Journal.
the 18th century, and the work was quarterly, and continued for about three years. Other separate works follow, both in Spanish and English; those among the latter that attracted most attention being his Practical and Internal Evidence against Catholicae, 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, 1835. 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 size of the work), to the Athenaeum, and Westminster Review, 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 1830 he settled in Liverpool, where he continued till his death, which took place on the 30th of May, 1841. He left a son, who in 1840 was a major in the English army. Of White'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 portions of his correspondence, edited by John Hamilton Thom, 3 vols. 8vo, London, 1845.

WHITE LIGHT is the name generally given to the light which comes directly from the sun, and which has not been decomposed by reflection in passing through a transparent prism; it is not, however, considered as a colour of light, being rather a union of all the differently coloured rays of which common light is composed.

A white light produced by mixing together 24 parts of saltpetre, 7 parts of flour of sulphur, and 2 parts of red arsenic, was used for the signals employed to render visible by night the stations by which the trigonometrical survey of France was conducted. This light was very bright, and could be seen by the naked eye in cloudy weather at distances exceeding 40 miles; but it has, since, been superseded for such purposes by other kinds of light. [Davison's Life of Captain 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, 1773. His father, William, Count of Orange Nassau, Duke of Berg, Prussian Stadtholder, was descended from John the youngest brother of the great William I. of Orange, and died at Brunswick, April, 1801. His grandfather William IV., the first Hereditary Stadholder of the United Netherlands (from 1748 who died in 1751), had re-united the possessions of the four branches of the line of Nassau—Otho, Baden, Siegen, Dillenburg, and Dietz with his own branch, that of Dietz. His mother was Frederica Louisa Wilhelmina, daughter of Prince August of Anhalt-William of Prussia. In 1778 he made a journey to Germany, and passed some time at the court of his uncle Frederick William I. He afterwards studied for a time at Leyden.

So long as the war lasted, from the 1st of October, 1791, to Frederick Louisa Wilhelmina, daughter of Frederick William of Prussia, and, in conjunction with his brother Frederick, subsequently distinguished as a general, effected considerable improvements in the Dutch army; but many important actions of the Dutch army, occasioned by internal dissensions, the patriots, who had been put down in 1787 by a Prussian force, secretly intriguing against the house of Orange. Some months had been taken up in this enterprise; but on the 9th of February, 1793, the State Convention declared war against the Stadtholder. Hoping with the assistance of the patriots, to obtain possession of the rich provinces of Holland, Demarcois conquered 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 16th of March, which had been gained over Daumont by the 3rd of March. The hereditary prince then hindered the French army of the North from penetrating into West Flanders; but on the 13th of September he was attacked in his position between Menin and Dunkirk by the army of the Duke of Brunswick, and forced to retreat. He was the most gallant resistance, in which his brother Prince Frederick, who commanded the right wing, was wounded, he was obliged to retreat behind the Schelde. Soon after this hereditary prince took up his residence in Bruges, and the Austrian army, driven 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 Fleurus, he was forced to retreat to Oudenburg, and from thence to Coburg, to retreat. The Austrians retreated, before Pichegru and Jourdan, behind the Meuse; and the hereditary prince, with his weakened army, had no alternative but to cover the republic in connection with the army of the Duke of York. But the fortresses 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 favoured the enemy, and the stadtholder was unable to save the republic, forsaken by its allies. His sons had resigned their commands on the 16th of January, and William V., with his family and a few faithful friends, embarked at Scheveningen on the 15th and 16th of April, 1795; where the prince was assigned him as his residence. His two sons returned to the Continent to arm a body of Dutch emigrants, at the expense of England, which had been dispersed again after the conclusion of the peace of Rastatt. Prince Frederick therefore accepted the Austrian service, and died at Padua on the 6th of January, 1799.

The hereditary prince then went with his family to Berlin, where he expected a favourable change in his position, from the diplomatic influence of the Prussian court, then in alliance with France. He acquired some estates in the vicinity of Posen and in Silesia, and when his father made over to him, on the 29th of August, 1807, his property in Germany allotted to him by the Reccess of the Empire (Fulda, Corvai, Dortmund, Weingarten, and other places), he took up his residence in Fulda, where, in the place of the inefficient university, he established a lyceum, and appropriated the revenues of two suppressed convents to the foundation of a national hospital. After the death of his father he assumed the government of his Nassau hereditary dominions; but as he declined joining the German Confederation of the Rhine, he lost the sovereignty of the possessions of the house of Orange, which were obtained by his relations of Nassau-Uningen and Weilburg, and Murat, Grand-Duke of Berg; while Weingarten fell to the Duke of Berg, and the field-marshall Maximilian, who became a prince of war in consequence of the capitulation concluded by Miihlendorf; he was allowed however to reside with his consort in Prussia. Napoleon declared that he, as well as the prince of Nassau, had forfeited his dominions; and Fulda was forced already, on the 27th of October, to do homage to the French Emperor. Corvi, Dortmund, and the county of Spiegelberg were incorporated in 1807 with the kingdom of Westphalia and the grand-duchy of Berg. Even the domains reserved to him, in the act of the Confederation, were taken possession of by Berg and Wurttemberg; Bavaria did not do so, and the other princes of the Confederation acquiesced in this night, and the not surplus of the revenue. William had come in the mean time with his consort and family to Danzig. When the war approached the Vistula, he desired to return to Berlin, but only his own interests, and a desire to save his dominions, induced him to remain at Friedland. When the army of the field-marshall Gneisenau was victorious, he devoted himself to literary pursuits. In the war between France and Austria in 1805, William, with the friend of his youth and constant companion, Fugel, joined the army of the Archduke Charles, and led a volunteer corps of English volunteers in Wagram. He then returned to Berlin, and in 1814 obtained the rank of Austrian field-marshall. Meanwhile, especially after the battle of Leipzig in 1813, influential men such as Hohenlohe, v. d. Lvne, Limpurg-Stein, Hopl, Died, Jengo,
and others, were exerting themselves at Amsterdam, the Hague, Rotterdam, Zotte, and other places, to effect the restoration of the house of Orange. William was at that time in England to concert measures with the Dutch government for the support of the Dutch cause. When the officers at Leipsic approached the frontiers of Holland, the inhabitants of Amsterdam rose on the 15th and 16th of November, and on the 17th the Hague declared war. This was unexpected; 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 irreparable disaster to the French empire. Some differences with France had diminished the influence of Holland; a creation of alarm in Paris, while the allies hailed it with joy, as an earnest of further success, and were encouraged to prosecute their military operations with increased vigour. When Captain Wauzz was sent from the Hague to the head-quarters of the allies at Frankfort, he met at Munich, on the 22nd of November, the Prussian general Bulow, who being informed of what had passed in Holland, observed that this insurrection would be as advantageous to the allies as a successful campaign; and the same general, a few days afterwards, assured Baron Van Zuylen, Van Nyevelt, and Count Bylandt, sent from Holland on a diplomatic mission, that the Rhine 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 in winter against the Rhine, the Rhine had remained 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 the extraordinary resources of his fertile genius.

As soon as William learnt what had passed, he embarked on the 28th of November, and landed at Scheveningen on the 29th. He was received with acclamations by the people of the Hague on the 30th, the towns of Amsterdam, where Kemper and Scholten, the commissioners of the provisional government, had issued on the 1st of December a proclamation, announcing ' 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 arming of the people, and appointed a commission of 200 commissioners, of which 60 were appointed 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 30th of March, and had occupied the States of Belgium and Liege, together with the Seven United Provinces, should be formed into one kingdom, and on the 18th of March, 1815, the prince was proclaimed at the Hague as King 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, 1815, 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 religious doctrines, made a change in the 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 draft of a constitution, it was laid before the States-general and deputies from the southern provinces, and finally proclaimed on the 26th of August, 1814. In 1815 the king founded the military order of William, and in 1815, after the battle of Waterloo, the civil order of the Belgian Lion, and on the 31st of July, 1816, joined the Nassau family in the house of Nassau, 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 aversion of the Belgians and the Dutch, and the dissatisfaction of the lower classes with the court at Brussels; divisions in the northern provinces between the friends of the old republican system and those of the new or monarchical system, tended to produce discord, which was kept within bounds only by the prudence and firmness of the king, and the mild conciliatory principles of his government. In the foreign relations of the government, in the main, the alliance between the Dutch and the Prussians, the forces of which were united, and the possibility of opening 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 sincerity in the church, in the army, and even in the assemblies of the States general. The intolerance of the Roman Catholic clergy, which, as was the case with the prieurs of the ancient order, the Jansenists, the 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 a great irritation in the country, and was afterwards passed as a law; but it 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, 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 of 1830 in France revived the old mutinous pride of the Belgian cities, and a rising of the mob in Brussel, on the 3rd of May, 1830, commenced the revolution which separated the northern and the southern provinces. In consequence of a second insurrection in Brussels, on the 20th and 28th of September, negotiations arose between the representatives of the Prince William, of the Prussians, and of the armed insurgents, conducted by foreign officers, which ended in the retreat of the Dutch. Meanwhile the king, yielding to the desire of a Belgian deputation of which this committee formed a part, consented to meet them 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 Propaganda, 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, recognised the independence of Belgium. This is not the place to inquire into the motives which induced four of the great powers, instead of exerting themselves to maintain and defend the bull-dog spirit, by which they had 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 acknowledge that the conduct of William I. on this great and trying occasion was such 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 eighteen articles presented by the great powers, particularly against that which proclaimed the freedom of the Scheld, and promised to the Holland, with equal earnestness, the establishment of a law of nations 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
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men, crossed the Belgian frontier; Turnhout and other places were taken; one Belgian army was defeated near Hasselt on the 18th, and a second, near Lokeren on the 10th; and 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 evacua-
ted the following day, the 15th, and his army retired to its post-
before the war. A treaty in twenty-four articles was then pro-
ounced by the London Conference, which was acceded to by
Belgium, but rejected by King William. Russia, Prussia, and
Austria had signed some articles, and France, though offered a
peace, a honourable one, but the clauses in the articles were to
be modified, but France and England had recourse to meas-
ures of coercion. England blockaded the coast of Holland, an
embargo was laid on the Dutch ships, and the caitled of Ant-
wragh was paid. By the 12th of December, after a memorable
siege by a French army of 70,000 men. This did not im-
mediately lead to peace between Holland and Belgium, but a
suspension of arms was effected on the 21st of May, 1833.

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 these negotiations, in hopes of some turn in
his favour, and hostilities between Holland and Belgium were
on the eve of recommencing at the end of 1833, and were pre-
vented only by the remonstrances of the Conference. At
length, induced chiefly by his financial embarrassments, Wil-
liam signed a treaty of peace on the 10th of February, 1834, signed
twenty-seven articles, modified to his disadvantage; and the
definitive treaty was concluded on the 19th of April, 1835, by
the plenipotentiaries of the Netherlands and Belgium, and of
the powers among whom.

But though Holland was now wholly separated from Belgium,
there was great excitement in the Dutch Chambers in 1833.
They hoped for favourable financial laws and judicial reforms;
instead of which proposals were laid an annual 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 Henrietta d'Outremeu, a Roman Catholic lady, ex-
cited 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 December, 1840, into the hands of the king's son William.
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'Outremeu,
and took the title of Hertog van Oostenrijk. On the 21st of
November, 1843, he left his large property for his family, besides a gift of ten millions of florins
to the Dutch treasury.

(Baron de Kerferd, Du Royaume des Pays Bas, vol. iii. Svo., La Hague, 1834; Brockhaus, Conversations Lexicon, 1846; Mémoires tirés des papiers d'un homme d'état; Mr. Chad, Narrative of the Revolution in Holland, London, 1803.)

WILLIAMS, DANIEL, D.D., a Protestant Dissenting
minister of the Presbyterian denomination, was born
at Wrexham, in Denbighshire, in the year 1644. The
advantages of his early education were compensated by
the natural endowment of his mind, and by his 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 minister. He was one of the most popular preachers in
several parts of England, though the times were so unsettled
that there was little prospect of his continuing his
labours without hazard. This circumstance, however, did
not prevent his remaining among his people; and, though
his talents and his prudence would have enabled him
to enter the church-establishment with a fair chance of
advancement. As, in these days, more religious liberty was
granted by Parliament, he removed his establishment from
England, and in 1690 Williams repaired to the soil-country, and unexpectedly

received an invitation to become chaplain to the Countess
of Meth, which he accepted. Some time afterwards he was
cited to appear in Dublin. Here he remained nearly twenty years, and filled
his station with great credit, being at the same time much
esteemed by the Irish Protestants in general. During his
residence in Ireland he had the management of a school
established for the purpose of for this did not meet with encouragement, which
proves that he was in advance of the age among his contemporaries in the practice of the art of poetry. In 1553, Dr. Williams became apprehensive respecting the safety of the Protestant succession, from the meanness of the prime minister, the Earl of Oxford; and he remonstrated on the subject with the pope and with the princes to whom he was in acquaintance. 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 bishop, who immediately sent it to the Duke of Northumberland, who, on his first sight of it, immediately took the letter to his lordship, who, already displeased with the doctor for the counsel which he had volunteered, now never forgave him. On the accession of George I. in 1714, he determined to give up London, and to return to the scene of his early youth, and to readmit 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 which 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, ascribes to him a "copious invention, a penetrating judgment, a faithful memory, and vigorous affections, which were cultivated by much application to study." His moderation was shown by his desire for a comprehension of the Revolution, on condition of a free toleration to the dissenters of 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 benevolent 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 he established medical charities in London, and for the maintenance of charity-schools in Wales. He sold left estates to the university of Glasgow, which at present furnishes six handsome exhibitions to students for the ministry amongst the poor. In 1717, he bequeathed all his library to his trustees. The last grand bequest in his will was four the establishment of a public library in London. For this purpose he had bought Dr. Bates's collection of books for between 500l. and 600l. 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 16,000 volumes; and in 1841 a new catalogue was made, in two volumes. The library contains treatises and sermons which had never been catalogued before.

Dr. Williams's library will be memorable in future time as the scene of preparation for many of those noble struggles for civil and religious rights, which have characterized the great social position which dissenters from the established church now enjoy. The large room in which the deliberations of the united ministers of the three denominations were carried on for weeks, is the object of much curiosity, and still remains. It is adorned with a magnificent collection of the portraits of the nonconformist fathers, and of their more immediate successors. It is well known however that the lapse of time has somewhat marred the beauty of several of the portraits, and that at least one of the three bodies, though still retaining its original name. So long as there was common ground of sympathy on which all could meet to redress common grievances, all things went on with harmonious success. The library was placed on both sides to be great and momentous, but they were not brought into question: other objects intervened, and the three denominations continued to be a political body aiming at a great social end, rather than a religious. They had scarcely had their 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 manifest itself. The three denominations, with the exception of the Unitarian members, who formed the great majority of the Presbyterian body, seceded from the three denominations on the 17th of March, 1836, and the Congregationalists, the Baptists, and the remaining orthodox Presbyterians are still known and recognized by the government as the 'Three Denominations,' whose meetings are now held in the Congregational Library, Blomfield Street.

(From Willams'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 Strebly, in Lincolnshire. He was educated at Eton and at King's College, Cambridge, and afterwards became tutor to the two sons of the Duke of St. Albans. He was a member of the Royal Society. He was appointedsuccessor to the Duke of St. Albans.

The Rule of通用art, 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 particular 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 Warter. 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, he was apprehended by the Inquisition, and is said to have been put to the torture; the grounds of charge being said to have been found in the works he had published. On the death of pope Paul IV. (1556), the discontented populace of Rome broke open the prison of the Inquisition; and Wilson was one of those prisoners who then escaped. On Elizabeth's accession he returned to England, was immediately taken into the public service, and rose rapidly from place to place. He was at first minister of state, and master of St. Catherine's Hospital, and private secretary to the queen; in 1578 he was sent as an envoy to the Low Countries; and in 1577 he was appointed one of the secretaries of state, and afterwards became a dean of Durham. He died in 1593.

WILSON, ALEXANDER, was born at Paisley, in Scotland, July 6, 1786. His mother died when he was ten years of age, and his father, embarrassed with the charge of a young family, soon married again. In 1793, he 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 sale 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, was reprinted before a literary society in Edinburgh, and published there in 1793, and in 1794, in Edinburgh, in a quarto book, with a portrait, from which is generally his 'Watty and Meg,' which some at first ascribed to Burns, to the no small gratitude 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 Newastle, in the State of Delaware, with only a few shillings in pocket, and a Dissenter's almanac in his hand. He was employed for a few weeks by a copper-plate printer; he then resumed successively his former occupations of weaver and pedlar, but afterwards became a land-measurer, in order to obtain a livelihood, and ultimately turned printer and book-binder, and engaged in the publication of various works in the 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 Kingess, 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 stimulated 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, particularly in the delineation of the human figure, but with little promise of 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 whole life had nearly a right into play. Writing to a friend in Paisley, in June, 1825, he says, 'Close application to the duties of my profession, which I have pursued 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 serious regularity of a teacher's life. I have had many pursuits since I left Scotland—mathematics, the German language, music, drawing, &c., and I now only wish 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 Reeve's 'Cyclopaedia,' engaged Wilson as assistant editor. Soon afterwards he explained to Bradford his views of a large work on American ornithology, and the bookseller undertook the publication.

Wilson was ambitious in his devotion 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 superfluous 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 receiving his book and endeavouring to obtain subscribers. He visited in fact every town within 150 miles of the Atlantic coast, from the river St. Lawrence to St. Augustine in Florida. He received much praise, but got few subscribers. Wilson however was not depressed.

The second volume was published in 1810, and soon afterwards he set out for Pittsburg on a journey to New Orleans. From Pittsburg he descended the Ohio by himself in a skiff. He started on the 4th 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. In doing this he shot 1700 birds and 700 ducks, and in the end 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 1818 he published the 7th volume. He had completed the pictorial materials for the 9th and 10th when he was carried off by an attack of dysentery in his forty-eighth year. He died August 23, 1813, at Philadelphia. The 9th and 10th 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 Lucy Bonaparte,folio, 1825-1828.

Wilson's pictorial representations of the birds are considered to be of great excellence. His descriptions are not only technically accurate, but exceedingly 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 foot 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 Lucy Bonaparte, in Constable's Miscellany.)

WOLF-FISH. [Amphicthys, P. C. S.]

WOLF-BANE. [Acustemon, F. G. S.]

WOOD, DECOMPOSITION OF. [Timber, Preservation of.]

WOODSIA, a genus of ferns, having circular sori, with an infundibular extension, divided at the edges into numerous capillary segments.

W. liberis is one of the rarest of our British ferns; it is found in only two localities in Europe, one in Wales, and one on the Banks of the British river called the W. In Scotland it is found in several places, and in the blackest part of mountainous places. The fronds are elongated, the pinnae triangular, with deep lobes, the rhizome tufted. There are varieties of this species, which are by some writers considered as distinct species, but Mr. Babington thinks this division unnecessary.

(W. Babington, Manual of British Botany; Newman, British Ferns.)

WOLFFE, JOHN. [Gandon, P. C. S.]

WORMWOOD. [Artemisia Abrotanum, P. C. S.]

WOUNDING. [Main, P. C.]

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X.

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 likely to form one of the most attractive portions of the British collection of antiquities. They consist of a large collection of sophranical marbles of various ages, which were first made known to the European public by Mr. (now Sir Charles) Fellows, who first performed the important task of collecting them in 1843. They were all found in or near Xanthus, the ancient capital of Lycia, a small country on the southern coast of Asia Minor. [A.MANOLI, P.C.S.] Xanthus is an ancient town, and was built on the river of the same name (now Etchon-Chid), 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 B.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 his 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 their will. 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. Fellows. These different conquests, will in some words, explain for the various characters of its monuments and inscriptions.

The origin of the Xanthian collection of marbles may be briefly described. In 1839 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 Cyclopean. The ruins were in many places covered with inscriptions, many in a perfect state, but in an unknown language, which Mr. Fellows resolved, by a resemblance of the language he found at the Corinthian tombs of the early Persians. Many of the ruins, the rock tombs, were described as resembling those of Persepolis. The ruins consist of walls, temples, tombs, triumpahal arches, and a theatre, and are situated on a flat, richly cultivated hill. The remains of the city are stately, and upon beautiful hills, some crowned with rocks, others rising perpendicularly from the river, which is seen winding its way down from the woody uplands, while beyond, in the extreme distance, are the snowy 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, in 1840, a second journey to Lycia, by Sir Charles Fellows, to give a more satisfactory account of his discoveries. The results of this journey appeared in "An Account of Discoveries in Lycia, 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 Government ofthe British Museum, and the facilities of transporting some of these Xanthian relicks to England and Great Britain in particular, after them from further destruction, an expedition was fitted out in the autumn of 1841 for the purpose, and permission being obtained, the collection of the Marbles was deposited in the British Museum in 1842. In 1843 a second expedition was sent out, and the remains of the Marbles arrived towards the end of the following year. The Marbles now consist of some hundred and twenty fragments of other monuments, and the whole will be shortly opened to the public, partly arranged in the Museum as they were originally found by Sir C. Fellows. The tombs have been named, from their sculptures, the Winged-chariot Tomb, the Harpy Tomb, the Chimera Tomb, and the Lion Tomb: the first two were found entire, the others in fragments. These two entire tombs, to which it is contemplated to reconstruct, are the principal marbles of the Xanthian collection. One, the Winged-chariot Tomb, is a sarcophagus, entirely of white marble, stand at the foot of a hill. The marble being a fine 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 tinged with 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 hoy's mane is a hunting scene; some figures are running, others are on horseback galloping, with spears in their hand, 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. Fellows, 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 crowching on their paws. Upon one side of the roof is a group, in which a warrior carrying a shield is seen cutting the base of a column. In the set 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. A nearly similar 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 or gables are traces of small carved figures. On one side of the tomb stands a chariot, given in "A 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 clavel seated on the central figure, who, clothed in rich folded drapery, with short hair, sits in the attitude of a judge, with an arm somewhat raised; before him stand two persons; the first is mutilated, but appears similar to the second, who has long bushy hair, crowned round the head, and looking like a wig; his attitude is that of a councellor pleading for the others; the loose robe falls gracefully from one shoulder, and is thrown over, so as almost 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-knit group." The word or name Pafisa is inscribed over the judge.

At the end, on a larger scale, are two figures of warriors, clothed with short mantles, and girdles of armour round their loins, above petticoats reaching nearly down to their knees. The back-ground of this bas-relief contains a long but, from mutilation, illegible inscription: it is copied in the Second Journal. On the opposite side of the tomb are two other figures of the same size; one, clothed in a loose robe, stands in a commanding attitude fronting 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 blouse descending below the thighs, and confined by a belt round the waist. The horse of the principal figure is ornamented with, and 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 its width at the side when exposed; it has been broken open in all its parts. In style of execution it is the imitation of a wooden structure.

Upon the other or Harpy tomb, a high square pedestal which was near the tomb at Xanthus, are two curious bas-reliefs. (First Journal, p. 232, and Second Journal, p. 170. Vol. II.—4 Y
Many of these fragments of sculpture built into the walls of the acropolises are now in the Museum; they are also engraved on certain of the larger coins of the Lycian kings. As these figures are the chariots and the costume of the figures of some pieces are of an early age. The forelocks of the horses are tied in a peculiar way, similar to those of some horses in a bas-relief at Persepolis, which has been noticed by Mr. Daniel Sharpe, who holds the opinion that, by its style, the head is meant to be a pig; he also has loose drapery, and a stick resting against his shoulder and held in his hand; before him is the figure of a warrior delivering up his armour: in one hand he holds the helmet, in the other a shield. On the middle of the east side an old man is also seated in a chair, likewise with a long stick resting against his shoulder; in one hand, which is raised, he holds what appears to be a small bird towards his face, and before him a child or youth is presenting a cock; behind the child are figures with one hand raised, and a dog looking back up into the face of the figure: behind the chair of the old man are two female figures, one holding a child on her side somewhat below the seat, the other holding likewise some small object up before her face. On each extremity of the west side is seated a female in a chair, looking much like the two to one of these ancient scenes: woman in her hand, towards the middle, is more than half way up, and on a very small scale, a cow suckling its calf; beneath the cow and calf is an opening in the tomb, which may have been intended as the doorway into the tomb; next to the opening, and looking towards the other female seated in the chair, are three females standing, similarly attired in loose drapery and in similar attitudes, each holding some small object down by their sides, and with the other hand raising a cup or other object to the mouth; the seated figure on this side is similarly occupied. They have all low head-dresses; some the tiara; others wreaths or plaited hair with tresses hanging down behind. The figures are about three feet high, and be four compartments, about nine feet in length, form the dress of the persons, and are elevated about twenty feet above the ground upon a square pedestal of grey stone, and roofed with two flat stones of a similar material; the bas-reliefs are in white marble. There is no inscription on this tomb, which, from the figures carrying off the children, is supposed to allude to the story of Pandarus, King of Lycia. These figures are the legendary daughters of Pandarus: Homer, Odyssey, b. xliii. (Second Journal, p. 170.)

Close to this tomb was another similar tomb of the same district, here called Glycy by the Lycian; covered with Lycian marble. These Xanthian tombs extend over several miles of country.

The walls of the city are extensive and massive; Cyclopean is blended with Greek architecture; and several gateways with massive columns have been left still existing. In the acropolises 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 Mr. C. Fellowes found a frieze about ten or twelve feet long and one in width, representing a series of fifteen small dancing figures with flags draping. There were the ruins of many, in all temples in the neighborhood: Sir C. Fellowes considered the sculptures to be Greek. He says however of the ruins generally—Xanthus possesses some of the earliest architectural sculpture in Asia Minor, and it is connected with the most beautiful of its monuments, and illustrated by the description of Xanthus at the Parthenon. These sculptures to which I refer must be the work of the sixth or seventh century before the Christian era, but I have not seen an instance of these remains which have been descriptive of the rebuilding of the walls; and yet the decidedly modern works of a later people are used as materials in repairing the walls around the back of the city and upper parts. Many of these are Greek inscriptions, with names common among the Romans. The whole of the sculpture is Greek, fine, bold, and simple, bequeathing an early age of that people. No sign whatever is seen of the works of the Byzantine.
one of the pediments also shows that the Persian is the de-
feated, not the victorious party. That the monument is a com-
manding one can be observed by any one living at a part of
the town.

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 date of a work from the state of its execution, in a
handling, there is not much rashness in pronouncing when it was
not executed; and there is evidence in the design and work-
manship in this monument to show that it was not executed
until Franz, the celebrated king of Portugal, had already
beneath, or certainly not earlier than about 400 a.c., and
probably considerably later. After a certain time, when mastery
has superseded hesitation in design and unskilfulness of execu-
tion, the masons left off working in the old manner, and
clidean stiffness of attitude are replaced by freedom and fac-
cility, with everywhere the evidence of a skilful expression
of what was required. The journeysmen also by whom such
marbles are long accustomed to the easy mastery of the
models of a finished age, themselves acquire peculiar
characteristics of execution; touches given with little trouble,
but 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 mon-
ument; the draperies of the mutilated female statues com-
bine the highest mastery in design with the utmost facility of execu-
tion. If these evidences are so strong, they are not
Before the works above quoted on these marbles, Sir C.
Cotgrave has published a pamphlet entitled "The Xanthian
Marbles, their acquisition and transmission to England," 1824.
Their inscriptions are already known to the literati, but it
may be well here to give a specimen of their freshness and
beauty on a stele or column described as erected to a son
of Harpagus, who was a celebrated boxer. (Kunstblatt,
1845, p. 306.)

XANTHIDUIM. Some of the minute organic bodies in
the chalk and flint of England are referred to this genus of
Insufusoria, but perhaps without sufficient reason. (Manet.)

XAVIER, FRANCIS, SAINT, was born at the castle of
Xavier, in Navarre, on 7th April, 1506. His father, Don
John de Jasso, was counselor 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 advan-
tages which the age and situation of the family could
command. He was early marked out for a public career, and,
when he was only seven years of age, he was sent to the
monastery of St. Martin de Brive, where, after a short stay,
he proceeded to the kingdom of Travancore, where, in one month,
he was established in his novitiate, and where, in the course of
four years, he acquired such a degree of proficiency in the
Arabic language, that he was appointed to teach the
language to the students of the college of St. Francis, at
Travancore. He then passed to the college of St. Francis,
and, after a short stay in the latter, was appointed to
the bishopric of Goa, and there, in the course of a year,
he was created a cardinal. He was then appointed to
the see of Macao, and, after a short stay in that see,
was promoted to the see of Canton.

In 1552, he joined Ignatius Loyola at Rome, where he
actively assisted him 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
Goves, who had been sent to Rome on a mission of import-
ance 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 Portuguese colonies in Asia. He had urged the need of
a Portuguese colony in 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 conversion of the Portuguese
inhabitants of the East. The king was induced to accept of
the society of six Portuguese, and the names of the six were
Thomas de Maia, Gaspar de Vitoria, and the brothers
Hippolito and Puitalo, who were selected by Loyola. As
he was about to set out on his journey to Lisbon, Bobadilla
was suddenly called back by the king, on account of his
brother's illness, and the commission of his chief to become his substitute. Having previously ob-
tained the benediction of the Pope, Paul III., on himself and
his holy enterprise, he left Rome in company with the Portugu-
ees, and arrived at Lisbon about the same time as the
ambassador. As the road to Lisbon was long and tedious. As they passed through

XAVIER, Simon, was born at Salsette, where he

influence of his death, he declined the offer of the
ambassador, and the king was inclined to accept of the
proposition. The king was, however, induced to take the
monument at Lisbon, and relations, whom it was probable he might never again see.

In the excess however of his zeal for the prosecution of the
purpose to which he had devoted himself, he declined avail-
ing himself of the offer of the Portuguese magnates. He
had promised, however, that he would show no transient pleasure of a lost farwell might leave too lasting an
impression of melancholy on his sacred enterprise.

Xavier and his companions arrived at Lisbon towards the
end of June. After spending a short time, and leaving his
companions of the Jesuit Society, he set sail on 4th April, 1541, Xavier embarked on board a vessel, which car-
ried Don Martin Alphonso de Souza, governor of the Indies,
but unaccompanied by Rodriguez, who had been persuaded by
the king to remain in Portugal. After a few months, they arrived at the coast of Mozambique in Africa,
where they wintered, and at Goa, the Portuguese seat of
government in the East Indies, on 5th May, 1542.

On landing, the first visit of Xavier was to the hospital;
his next to his spiritual superior, the bishop of Goa, to whom he
presented the brief of Paul III., and implored his sanction
and blessing on his missionary enterprise. He had scarcely
commenced it, when he made the painful discovery that the
disciplines in which he was anxious to instruct the infidels,
were openly contradicted by the life and example of the
greater part of the Christian residents in Goa. To their
spiritual reformations, he directed all his attention; and,
going from street to street, with a bell in his hand, he
summoned every inhabitant to send him his children and slaves,
in order that they might receive Christian instruction.
Having secured his intentions, he directed to his superiors
his ministrations to expose the prevailing vices, and to present
the remedies which religion affords. From the Christians, his
zeal extended itself to the infidels, whose temples he caused to be
destroyed, and churches to be erected on their site.
His labours were speedily rewarded by Goa by a marked reforma-
tion among the inhabitants. After a residence of six months
in that town, he left it to visit the coast of the pearl fishery,
which extends from Cape Comorin to the Isle of Man.
There he found that, although a large proportion of fishers
had been baptized in the Christian faith, they had, for want of
instruction, retained the vices and superstitions of heathendom.
In order to give them that instruction, he laboured for some
time most assiduously in acquiring the Malabar language.
His first preaching among them was attended with extra-
ordinary success. After a stay of fifteen months on this
station, he returned to Goa for the purpose of procuring assis-
tants to his work; with them he returned, in 1544, to the
fishers of the pearl coast, and left several of them in different
parts of his work. In 1547, he proceeded to the kingdom of Travancore, where, in one month,
he was in the hospital of Goa, where he devoted himself to the service of the sick, without neglecting the principal object of his mission,
which was to instruct the people. A large number of con-
verts from among Mohammedans, Jews, and others, was the
result of his labours. While at Malacca he was joined by three
other Jesuit missionaries, whom Ignatius Loyola had sent
to cooperate with him. In company with them, on the 1st
January, 1546, he set sail for the islands of Banda, and, it is
said, became the happy instrument of the conversion of
the entire crew of the vessel which carried him. From hence
he proceeded to the island of Ambon, 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
Moluccas, he broke up for the coast of Java, by which he
reached the island of Celebes. On this voyage, he reached
the island of Balipoo, where he had planted the faith: he arrived at
Malacca in 1547. After leaving Malacca he made some stay
in Java, and then proceeded to the coast of Sumatra, and then
over to the island of Ceylon, where he converted the King
of Candy and several of his subjects; on the 30th May, 1548, he
returned to Goa. At Malacca, he had met with a Japanese
name, named Auger, who, on his return, accompanied him
for some time. Having baptized Auger, with two of his domestics, and given

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him the more Christian name of Paul of the Holy Faith, he set out with him from Goa on this difficult enterprise. After making a short stay at Malacca, he embarked on board a Chinese vessel, and arrived on the 15th August, 1549, at Cangoxima, in the kingdom of Sancian, in Japan. [JAPAN, P. C.] The chief difficulty he had to overcome in this expedition was his ignorance of the Japanese language. Xavier, during his voyage, had, by means of his convert, acquired some little knowledge of it, which was increased by his stay of forty days at Cangoxima, and which was sufficient to enable him to translate into it the Apostles' creed without an 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 Sancian, 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 excursions, he left Sancian, and proceeded to Frindo, 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 Cangoxima in a whole year. Encouraged by this success, he left these converts under the care of one of the Jesuits who had accompanied him, and set out for Macao, the capital of the whole empire and the residence of his ecclesiastical chief. [JAPAN, P. C.] On his way thither he visited Amanoguchi, the principal town of the kingdom of Naugato, where he was allowed to preach in public and before the king and his court, but with little success: after a month's stay in that city, he continued his journey towards Macao. 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 pushed on onwards, resigned and cheerful. He arrived at Macao in February, 1551, having been about two months on his journey. There his most necessary and wearisome garments proved a subject of offence to the inhabitants; accustomed to the gorgeous and pompous ceremonial of their own religion, the priests, whose influence was paramount in that city, could not see in this new ambassador of the God of High. Though rejected with contumely, Xavier did not abandon his holy purpose, but returned to Amanoguchi, where he provided himself with a rich suit and a retinue of attendants, and thus attired presented himself before the court. This harmless device procured 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. These 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, he departed from Amanoguchi, in September, 1551, and, on the 30th of November following, embarked to return to India, having remained in Japan two years and four months. This mission was, for upwards of a hundred years after the death of Xavier, regarded with such reverence by the Japanese as to be called the 'Xavier's mission.' [Missons, P. C., vol. xv., p. 267.] On his voyage he made some stay at Malacca, chiefly for the purpose of concerting measures with the governor 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 embassy should be sent in 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, determined to proceed to Macao, and, after many unavailing entreaties to persuade his consequence, 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 prosecuting his journey farther, and strongly represented to him the danger. 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 that coast. It was by this means that he was encountered 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 venture, he certainly had no reason to complain of 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 arrived December 2, 1552. His remains were brought over to Malacca on the 22nd of March, 1558, 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, 1554. 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 1619, and he was canonized as a Saint by Gregory XV. in 1622. In 1747, John V. King of Portugal, obtained a 'benedict' of Benedict XIV., which conferred on him the title of patron and protector of the East Indies. His festival is observed by the Church of Rome on 3rd of December. The works of Francis Xavier have been translated into many languages, and are numerous, and not sufficiently known in England; Pan Cyclo. art. 'Missions;' the statement made in it that Xavier was canonized by Urban VIII. is erroneous, but it is true that this pope first gave him the title of the 'Patron of the Indies.' The life of St. Francis Xavier has also been written in Latin, by Turcinus, Rome, 1594; in Italian, by Orlando, Barròli, and Maffei; and in French, by Boisbour, a work which was translated into English by Dryden in 1688. XULIONOSPONTINII, one of the fossil fruits of Shropshire. Bowerbank.) XYLOPHIA, a genus of plants belonging to the natural order Annonaceae. It has 6 petals and numerous stamens; the calyx from 8- to 10-lobed, the segments ovate, concolorous, and acute; the ovaries distinct and numerous; the ovules ascending in one row attached to the central axis; the carpels free, ovate, compressed, indihecious, 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, pubescent on the upper surface especially by the base. The flowers are small, the hypanthium ovate, ovate, compressed, indihecious, stalked, and from 1- to 4-seeded. X. glabra is a tree native of Jamaica and Barbadoes. The branches are smooth and scarcely dotted; the leaves oblong, ovate, and smooth, on very short stalks. The peduncles are slender, solitary or in clusters of three. The calyx is smooth, trihedral, with very obtuse lobes; the carpels smooth. The flower-buds are oblong, pebbaceous on the outside. The wood, bark, and berries of this tree have an agreeable bitter taste, similar to that of the lime. 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 glass-house in moderate heat. (Don, Gardner's Dictionary; Lindley, Flora Medica.)

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ZAMITES, a genus of fossil Cycadeoidea from the coalitic, wealden, and cretaceous formations (Prel.) synonymously with Mantellia and Brogniart.

It is a plant of Africa, at the western extremity of the Gulf of Aden, not far from the Straits of Bab-el-mandeb. It is situated in 17° 49' N. lat. and 43° E. long. The harbour is small and shallow, so that even small vessels cannot come within half a mile from 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 a sufficient protection against the Somalils, who inhabit the surrounding country. The population is stated not to exceed five hundred souls. All families are engaged in trade, Zeela being one of the harbours by which the inhabitants of Harran carry on a commercial intercourse with Arabia. Three caislas arrive annually from the interior, especially from Harran. They bring to Zeela 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 cloths, Indian piece goods, European prints, silks, silk thread, shawls, red cotton yarn called shumah, beads, zine, copper-plate, frankincense, and Austrian dollars. Zeela is subject to the Pasha of Egypt, by whose authority the Deliah of Mocha nominates the Zeela, who pays an annual tribute of 300 dollars, and keeps a garrison of seventy soldiers, armed in part with matchlocks.


ZAMUN, SHAH. [SHAM DIN, 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 tonic and antispasmodic. By disinfecting properties, it is more powerful than either of those forms 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 valued. 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 cord. Hence the nerves of motion, and the functions of the circulation and respiration, are chiefly acted upon; it produces its effects slowly, 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 body system, irregularities in the circulation, and sudden congestion of blood, being the immediate causes of attacks of epilepsy and hysteria, the diseases which are most benefited by one of zinc.

In spasmodic affections of the chest, as asthma, angina pectoris, and palpitation of the chest, when these do not proceed from organic derangements, oxide of zinc is often serviceable. In the action of the stomach, the cramps of the stomach to which habitual drunkards are subject, it is very useful.

Irrap礁 oxide of zinc is called tarry. It is sometimes used in medicine as an antispasmodic, astringent, and disinfectant, and to heal ulcers and cracks in the skin. It is also used as an ointment. Pure oxide of zinc forms an ointment of much value where a mild astringent is needed, especially in the chronic cases of ulcers.

Carbontate 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 ulceration.

Sulphate of zinc 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 practice of doctors to use it internally, 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 coughing fits 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 burns and ulcers, of the living tissue, and 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 nevi, material, or mother-marks. In some of these it is to be recollected that they are very superficial. Deep-seated cancer of glands can scarcely be removed by it, but other forms are often successfully treated by it. (Walshe On Cancer, p. 219.)

Cyanide or cyanuret of zinc is a powerful antispasmodic and tonic. No medicine is so potent in allaying irritability 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-douloureux and other nervous affections. Where the patients can tolerate the repulsive colour and pungence in its use, it often proves very serviceable.

Zinc pans have been much recommended for use in dairies, as the milk speedily coagulates in them, and the quantity of cream is great: but if the milk become sour while in them, the acid acts upon the zinc, and affects perhaps not poisonous compounds. Upon the whole, white porcelain vessels, kept thoroughly clean, are the best material for milk-vessels.

ZINGIBER OFFICINALE.—(Ginger), Medical Properties of. The native country of this plant seems unknown, though Goebbels asserts that it is Guiana. It is however extensively cultivated in China, Java, and the East and West Indies. From the cultivated plant alone is the ginger of commerce 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 of 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. These, when prepared, are mostly used fresh, or preserved in sugar, and constitute the sweetest known 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,caled in hot, water, and dried in the sun. White ginger is also described as calced, and then scraped to free it from the skin, then 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 dried in the sun externally, and in a solution of lime, of which often adhere 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 yellower 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 Bechols:—

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pale yellow volatile oil</td>
<td>1:56</td>
</tr>
<tr>
<td>Aromatic, acid, soft resin</td>
<td>3:80</td>
</tr>
<tr>
<td>Extractive soluble in alcohol</td>
<td>6:55</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>19:95</td>
</tr>
<tr>
<td>Apothene, extracted by potash</td>
<td>20:00</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>

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 alcohol, and evaporating the ethereal tincture, is not quite analogous to the principle Zingiberin, procured by Berol, and by him termed peppermint. This last is got by submitting ginger directly to the action of sulphuric acid. Berol 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 remote ones. Thus, when chewed, it is a powerful saline, 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 catarrh of old people. The mucous membranes of the urino-genital organs are also excited by it in languid habits; many 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.

ZUMALACARREGUL. [Spears, P. C., p. 360.]